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Queer(y)ing Sex And Gender :

An Analysis of Two Sociological Concepts

by

Sheryl Anne McInnes ©

A thesis submitted to the Faculty of Graduate Studies and Research in partial fufillment of the requirements for the degree of Master of Arts

Department of Sociology

Edmonton, Alberta

Spring 1996

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ISBN 0-612-10677-2

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Dr. Susan McDaniel

Sharon McIrvin Abu-Laban

Dr. Sharon Abu Laban

Dr. Debra Shogan

February 7, 1996

Dedication:

For all the women upon
whose shoulders I stand.
Especially for Maureen,
who stands next to me.

Abstract

'Sex' and 'gender' as concepts, categories or variables are commonly used in social theory and research across academic disciplines. It is often unclear whether 'sex' and 'gender' are or should be used as separate or interchangeable concepts. Using both an archaeological and genealogical narrative approach, this thesis explores the history of the concepts of 'sex' and 'gender', and the processes of sexing and gendering bodies within the conceptional frameworks of European, Christian based knowledge from antiquity to the present. Particular attention is given to the connection between Darwinian theories of evolution and the development and use of statistics and mathematical probability in the construction of 'normal' sexed and gendered human beings. It is evident from the genealogies of 'sex' and 'gender' that although these concepts are interrelated through technologies of knowledge production at various points in time, 'sex' and 'gender' should be used as separate concepts in social theory and research.

Acknowledgment

Few written works are accomplished without the support of friends, family, and colleagues. I would like to acknowledge the support of my Supervisor Dr. Susan McDaniel and Committee members, Dr. Debra Shogan and Dr. Sharon Abu Laban. Their good cheer and faith in this project brightened many a dull day. The technical assistance of my life partner Maureen Irwin was invaluable. And finally many thanks to all those who listened patiently as I pushed toward understanding.

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Queer(y)ing Sex and Gender:
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Chapter I   Introduction: Gender[2] in the Present Moment

> ... gender is analytically privileged ... as the most salient characteristic of persons, social situations and the written materials which record these. (Stanley, 1995: 86)

> "Sex" is, thus, not simply what one has, or a static description of what one is: it will be one of the norms by which "one" becomes viable at all ... (Butler, 1993:2)

The topic for this thesis arose out of two events in my life, one intellectual, one personal. In the Fall of 1988, a Sociology professor challenged me to find the 'mothers of Sociology' after I protested his persistent use of 'fathers of Sociology'. For that course paper, I found a number of women who had been involved in the development of Sociology, and then went on to write an undergraduate Independent Study on Gender and Social Thought. While writing that second and larger paper, I became entangled in the tautological absurdity of trying to explain the effects of gender, by using gender as my analytic tool. I was trained to avoid references to the body and biology, to concentrate on social facts and the social construction of categories like 'woman' and 'man'. The only escape from the tautology was through biology, a return to the embodied categories of 'male' and 'female'. In a historical paper, this return to the body was not completely satisfactory because the meaning of male and female, and the relation between sexed bodies and the effects of gender, appeared to shift in some unaccountable way between the early eighteenth century and the late nineteenth century. My pleas for help, to make the concept of gender work for me, were generally met with puzzled silence from fellow students, faculty, and the literature. Five years later, I have turned back to this puzzle. The research questions to be addressed in this thesis are:

- What was the concept of gender created for? How has it come to be 'analytically privileged'?
- Has gender always been the 'most salient characteristic of persons'. Has sex always been the 'norm' that makes persons 'viable'?
- Is there a relationship between the concept of sex

and the concept of gender; how is the concept of sexuality related to sex and gender?

- Has sociology/social theory played a role in the creation of the concepts of sex and gender?

Just prior to delving into the mystery of women's exclusion from the founders of Sociology, I had reclaimed my lesbian self from a twenty year retirement in wifedom and motherhood. The issues of sex, sexuality and gender were being played out in my everyday/everynight life (Smith, 1990). In Garfinkel's (1967) words I was attempting a transfer from one sex status to another and discovering how rigid the boundaries are. It took several years to drop the imperatives and performances of womanhood from my life, to reclaim my body-comfort from layers of social conditionings. As I puzzled over the relationship between sex and gender at the intellectual level, my own personal struggle was hinting at answers. However, in good mind/body splitting style, I was not making the connections between my own subjectivity as woman-lesbian and the knowledge that I used to constitute myself as either or both of those categories. To get at what was happening I had to turn away from the concept of gender and explore the social meaning of 'normal' in relation to my femaleness.

The concept of gender became problematic for me at the site of the intersection between personal biography and the history of women.[3] The answer to my research questions lies in making that intersection meaningful by allowing my perspective as a lesbian and feminist sociologist to interact with a history/genealogy of the social concepts of sex and gender. I am focusing on sex and gender as concepts, rather than on their effects, or maintenance in daily life, in order to situate their history within conceptual frameworks for knowledge production, and the power networks that legitimize knowledge. The methodology underlying the historical narrative follows from Foucault's (1970, 1972) notion of archaeologies of knowledge. I part with Foucault in using the more flexible ideas of conceptual frameworks, reorganizations and revolutions in the work of Paul Thagard (1992), and Ian Hacking (1990). As MajorPoetzl (1983) points out, Foucault's epistemes tend to be rigid constructs that presuppose an incommensurability between epistemological periods, and do not allow for subtle shifts in conceptual systems within, and across, epistemological periods.

The history/genealogy of the concepts of sex and gender presented here, is constructed in a narrative form that begins in this Chapter with the events surrounding the first use of the term 'gender' in relation to human affairs. I have chosen a narrative format in order to slide back and forth across historical events, introducing themes where they are appropriate rather than situating each conceptual event in a single chronological strata. Although I do use familiar terms for historical periods, I wanted to avoid a traditional periodization that cannot capture the way conceptual frameworks are organized and reorganized over time. In Chapters Two to Four, the narrative moves from ancient beginnings to the end of the nineteenth century. Chapter Two on beginnings is in more chronological order than the other two chapters because I felt that it was important to illustrate that the development of the 'pre-scientific' division of male and female bodies was a dynamic and dialectical process, not a static accumulation of fact. Gendering as a social process is developed in parallel to sexing through two themes, hermaphrodites and women's relation to the written word.

The topic areas for the narrative were developed by reading back from contemporary social and feminist theory on the concepts of gender, sex and sexuality. As I read I kept a list of names, references to other concepts, and ideas that were cited across various theoretical perspectives, as authors discussed or questioned gender, sex or sexuality. The citations provided me with a bibliographic trail that I followed backward in time, picking up new names, concepts and ideas to be traced within the limits of translations, and the availability of interpretive collections of historical materials. Where possible three sources were used to confirm facts, and check the accuracy of interpretations. This material was then collected into a narrative for the reasons given above. My aim in following a bibliographic trail was to allow emerging data to lead my inquiry, rather than impose my ideas of what might be important. Even with this in mind some selection was necessary to confine this thesis to an acceptable length. The criteria for selection was not that it 'fit', rather, was it strongly connected to the concepts of masculinity and femininity that structured gendering, or to the processes of sexing and sexualizing bodies. That was always a judgment call. Others may see connections that I did not, and include that information in another history/genealogy.

The historical inquiry is confined to the geopolitical frame of the line of Western thought that originated with the ancient Greek and Hebrew, developed in the context of the Roman state, and then entered western Europe within

Christian doctrine and practice. The omission of the knowledge(s) originating with the indigenous peoples of Europe, and in non-Christian, nonEuropean/Caucasian thought, limits this discussion to particular paradigms, epistemologies and methodologies. The task of opening the concepts of sex and gender to genealogies will require many different paths.

The interpretation and analysis of the historical narrative undertaken in Chapter V. is situated in a feminist perspective that takes social theory as a multidisciplinary enterprise. The interpretive analysis makes reference to theory, but does not rely upon any particular theoretical framework. I found that in trying to fit the data into any specific theoretical perspective, the subtlety of the connections among the technologies and methodologies within, and across conceptual frameworks was lost. The tendency was to shape the history of sex, gender, and sexuality to fit the expectations of a theory, rather than allowing each of these concepts to tell its own story; a story often at odds with what one might expect. Within the reading of contemporary work on sex, gender and sexuality, I did not find a direct reference to the concept of harmony. That emerged from data, and was confirmed by readings in the history and philosophy of the sciences. Nor was the connection between evolution theory and statistics/probability directly referred to. It was the constant appearance of the word 'normal' that led to that connection; a connection often clear in studies of race eugenics, but not as clear for a sex-eugenics.

There are a few disclaimers that have to be made in regard to the narrative and the interpretation. The 'women' and 'men' referred to in most of the narrative are white Europeans who were of the upper classes in terms of social status, income, and/or education. The concentration on sex, gender and sexuality is not meant to negate the importance of race/ethnicity, estate/class, and other divisions of humanity in peoples lives, or the importance of race and class in the creation of the concepts of sex, gender and sexuality. And finally, the boundaries of location have often been ignored, blurring the differences in cultures across Europe/Britain. When there was doubt about an idea crossing these boundaries, I checked that English/French etc. translations had been available within a reasonable amount of time. The Oxford English Dictionary (1989), with etymological entries was helpful in this process. History, particularly women's history, is not an exact science. As I was writing, new texts became available, creating the need to revise as I went along.

The definitions of sex, gender and sexuality in the notes at the end of this chapter reveal the confusion that can arise when we try to define these terms. More specific dictionaries do little to clarify. *The Penguin Dictionary of Sociology* (1986:95) begins by stating, "If the sex of a person is biologically determined, the gender of a person is culturally and socially constructed. There are thus two sexes (male and female), and two genders (masculine and feminine)." Maggie Humm's (1990:84) *Dictionary of Feminist Theory* states that, "gender is a culturally shaped group of attributes and behaviors given to the male or to the female". Sex on the other hand is "the biology of a person" (1986:201). We might ask of these two definitions, who determines what counts as biology; how does gender get constructed; how is it 'given' to the male or female; and how do we know that there are two sexes and two genders? As I will demonstrate in the Chapters to follow, a degree of uncertainty may surrounded gender as a concept, but gendering as a process had very specific meaning, and sex is not as biological as the definitions suggest.

Conditions Giving Rise to 'Gender'

> ... with few exceptions, there are two sexes, male and female ... most people fall under one of two separate bell curves, the one which is called 'male', the other 'female'. (Robert Stoller, 1968. quote in Oakley, 1972:159)
>
> People may be absolute about male and female. Nature is not. (John Money, 1986. quote in Hausman, 1995:95)
>
> Every society exerts close controls over transfers of persons from one status to another. Where transfers of sexual status are concerned, those controls are particularly restrictive and rigorously enforced. (Harold Garfinkel, 1967:116)

In this section my goal is to examine the invention[4] of the contemporary concept of gender, as it occurred during the period from 1955 to the 1970's. The socioeconomic-political and ethical conditions of this time period are being bracketed in order to foreground a series of knowledge conditions that were necessary for an ancient idea and its practices to acquire a name, and thereby be constituted in language as a category for theory and research. Although the conditions that I have selected for this narrative overlap in time, I am treating them separately for clarity.

The first condition necessary for the intelligibility of the concept of gender was a recognition of the hermaphrodite as a living being that embodied ambiguity. The lack of certainty, or lack of rigid boundaries in the mix of chromosomes. hormones, gonads, internal reproductive structures and external genitalia represented by hermaphroditic types of humans, called into question the biological givens of male and female, man and woman, constructed by the natural and social sciences according to norms of body structure and performance (Hausman, 1995). As the historical narrative will show, the hermaphrodite as living being, or as metaphor, has been represented in Western cultures and its antecedents in cosmogonies, mythologies, philosophies, early medicine, Christian doctrine, alchemy, and the sciences, and been incorporated into both the constitution, and control, of sexed bodies and sexualities (Epstein, 1995)

The medicalization of hermaphroditic conditions began in the sixteenth century, when the idea of ambiguity in the body disrupted the growing idea of a natural harmony in sexdifference; a complementarity of bodies necessary for reproduction (Epstein, 1990). The presence of the hermaphrodite suggested not only a lack of harmony, but also the possibility that some living beings could be by nature, sodomites or tribades (Daston & Park, 1995). In the nineteenth century with the technologies of statistics and mathematical probability the hermaphroditic condition became a perversion, or pathology set against the normal predictable condition of each body having one true sex based on body parts and functions associated with reproduction (Foucault, 1990a). The discovery of sex chromatin (XX and XY markers) in 1906, and the sex hormones (androgens and estrogens) in the 1920's and 1930's extended the scope of a measurable 'normal' to the hidden forces in genes and bodily secretions (Hausman, 1995, Findlay, 1995; Epstein, 1990; Kessler, 1990). These discoveries and the meaning given to them provided the second condition for the development of the concept of gender. By the 1940's the third condition was met as safe and effective plastic/cosmetic surgery became available. This allowed the possibility of sex change, or sex adjustment surgery for those diagnosed as intersexed, the new word used to cover the variety of hermaphroditic bodies. By the 1950's body ambiguity could be erased with hormone therapy, or surgery, or both. The decision on which of the two sexes would be constructed from the ambiguous body, was problematic when the hermaphroditic condition was not discovered until well after birth.

It is from this point in time that we can construct a history of gender as a concept. From the late nineteenth century up until 1955 the social, economic, political and ethical practice of dividing humanity into men and women by characteristics and behaviors (gendering) was not marked as something separate from the division of humanity into male and female according to body parts and functions.[5] The terms sex, and sexual incorporated both the natural and the cultural (Hausman, 1995) The fact of intersexuality disrupted the view that the human body was always, and forever, one sex or the other. At the same time the persistence of the two, and opposite, sex model that emerged from nineteenth century Social Darwinism suggested that beneath the empirical evidence of the intersexed body, there lay some truth that could be used to render that body 'normal'. The fourth condition necessary for the concept of gender was met by psychological testing methods used to determine masculinity and femininity, where sex roles were the determinant for a psychosocial sex identity (Hausman, 1995). In other words, maleness and femaleness could be extrapolated from measures of a person's compliance with appropriate social behaviors as masculine/man or feminine/woman.

John Money and Joan and John Hampson[6] used the cultural signifiers of masculinity and femininity, measured as sex role and sex identity, to determine the social performance of the hermaphrodite/intersexed individual. They named this social performance 'gender role', meaning "all those things that a person says or does to disclose himself or herself as having the status of boy or man, girl or woman" (1955: 285). This gender role included both procreative and erotic sexuality. A gender role was not something established at birth, it was acquired like language. Therefore the assigned sex as observed at birth, and the sex of rearing were the criteria determining the direction of a medical intervention, rather than chromosomes, gonads, hormones, or organs of reproduction. Gender thus signified a person's personal, social and legal status as male or female without reference to sex organs (Money, 1986 interview in Omni, cited in Hausman, 1995:95). This was a complete reversal of the nineteenth century paradigm that assigned status as man or woman by direct correlation with body parts; a woman was a woman because of her ovaries, not because she had been raised as a woman, or acted in a feminine way.

The fifth condition for the constitution of gender as a concept emerged in the 1960's from the work of psychoanalyst Robert Stoller in relation to the etiology of the transsexual.[7] The most common type of transsexual presenting for treatment during the period 1940 -1960 was the male-to-female, who as a man felt feminine and therefore wished to be a female by correcting his body (sex) to match his preferred social performance (gender role). Although Stoller used the work of Money and the Hampson's, he coined the terms 'gender identity' and 'core gender identity' to describe the specific internal (private) feeling of being male or female, in contrast to gender role (public) as masculine and feminine behaviors (Hausman, 1995). Stoller did not include nonprocreative sexual practice and fantasy within the idea of gender identity. This left same-sex desire as part of a gender role, but not a part of 'core' gender identity.

In the preface to *Sex and Gender*, Stoller (1968) makes the distinction between sex as biological, and gender as cultural, specifying that it is for psychological phenomena (behaviors, feelings, thoughts, fantasies) "that the term gender will be used" (1968:vii). Further, he named the terms of gender as masculine and feminine, adding that the normal male would be masculine, the normal female, feminine without any necessary reference to anatomy and physiology. This implies contra Money and the Hampsons that masculinity and femininity are internal states rather than descriptions of external social performance. Within the division between sex and gender that Stoller set up, he suggests that in commonsense thinking there are no absolute standards for the demarcation of gender from sex, but that he would confirm that "each may go in its independent way" (1968:vii). The self-acknowledged foundation for Stoller's theory of the relationship of sex to gender was Freud's[8] theory that sexuality is determined by life experience not by organic factors.

Harold Garfinkel, a sociologist working in collaboration with Stoller, used the investigations into the nature of the intersexed to attempt to explain intersexuality as a social phenomena. Following Parsons, Garfinkel (1967) treated the 'normal' and 'naturally' occurring sexed person as a cultural object who complies with a moral dichotomization of the 'sexes' because these were the only legitimate forms within the social order. Normal and natural 'sexes' were determined by the presence of a penis (male), or a vagina (female), that is by body parts. Thus sex was a taken for granted category. What interested Garfinkel was the negotiated passage from one sex status to another through the behaviors of masculinity and femininity learned in the interactions between individuals in everyday life. Masculinity, and femininity, and therefore being a woman or a man, were achieved, not innate[9] (Hausman, 1995). Thus through ethnomethodology, Garfinkel repeated the message of Simone de Beauvoir in 1952 that a woman is not born, but rather becomes one.

By 1968 the term gender was conceptualized as social performance, a cultural manifestation of psychological states, and a socially achieved sex status. Although Garfinkel acknowledged a direct relationship between body parts and a negotiated sex status, both Stoller and Money were suggesting that this relationship was not absolute. One could be organically female, but have a preferred gender role, and/or a core gender identity that was masculine. In 1972, British sociologist, and feminist Ann Oakley brought these ideas together in *Sex, Gender and Society,* a survey and critique of biological, psychological, sociological and anthropological arguments on the position of women in society(s). She used Stoller's definition of sex as biology and gender as culture, claiming that sex differences were natural, and gender differences were cultural. In the same year John Money and Anke Ehrhardt published *Man and Woman, Boy and Girl: The Differentiation and Dimorphism of Gender Identity from Conception to Maturity,* which as the title suggests reinforced the reality of the dualisms of male/female, masculine/feminine, woman/man in the development of gender role/gender identity. As Fried (1982) points out, an a priori of fundamental duality meant that all discussions of gender (and sex) had to occur within that context. This meant that during the 1970's and early 1980's gender theory tended to move between the essentialism of dividing humanity into two categories by sexed body parts, and the constructionist division of humanity into two different categories by social characteristics and behaviors. Neither perspective questioned the limitations of using concepts that continued to naturalize a two sex, two gender world view, or the assumptions that lie behind the repeated use of taken for granted terms like 'normal' to structure the dualities within the concepts of sex and gender.

After the publication of work by early feminists, and social theorists, Germaine Greer, Kate Millet, Nancy Chodorow, and Michele Barrett,[10] who credited Robert Stoller for the use of the concept of gender and the distinction between sex and gender, the link with Freud and psychoanalysis through Stoller, and the link between the concept of gender and the intersexed, and/or, transsexual in the work of John Money disappeared (Gatens, 1991). The focus of feminist and social theory on sex and gender largely turned away from an historical or critical analysis of sex and gender as concepts, toward a series of theories on the effects of gender, or how gender was constructed, maintained, or reproduced in historical or contemporary life. The concept of gender began as a loosely defined idea, based on the reality of one subset (intersexed) of the population; a reality analyzed through psychological, psychoanalytic and interactionist perspectives with little or no reference to broad social phenomena.

Putting Sex and Gender Together

> ... the social organization of sex rests upon gender, obligatory heterosexuality, and the constraint of female sexuality. Gender is a socially imposed division of the sexes. (Rubin, 1975:179)

In 1975, Gayle Rubin, a feminist anthropologist introduced a new concept through an analytical mix of Freudian and Lacanian psychoanalytic theory, the structuralism of Levi-Strauss, and Marxism. She labeled this concept the sex/gender system as a "product of human activity", particularly the political economy of the historical exchange of women between and among men (1975:179). Rubin defined this sex/gender system as "a set of arrangements by which a society transforms biological sexuality into products of human activity". Therefore, "sex as we know it is itself a social product" (Rubin, 1984:307). The idea of a sex/gender system became synonymous with systems of male dominance and a hetero-patriarchy, making heterosexuality central to women's oppression (Haraway, 1991). This also reinforced the notion of a nature (sex)/culture (gender) binary, wherein women were made victims of their female nature through culture, specifically masculine culture.

In her 1984 essay *Thinking Sex*, Rubin made a fine, but important distinction, in regard to sexuality. The concept of gender, which in her 1975 *Traffic in Women*, was intertwined with sex (bodies) to produce sexuality, was now, following Foucault, removed from sexuality to allow sexuality to stand on its own as a concept separate from gender. This overlooked the fact that gender as a concept was produced in discourses that addressed issues of both sexed bodies (male and female), and sexuality in its procreative and erotic meanings. The point here is not that Rubin was wrong, rather that by the 1980's the concept of gender began to take on whatever definition was required for a particular theory.

Gender and sex were also pulled together in 1978 by Kessler and McKenna, who following Garfinkel, made the claim that gender provided the frame within which we could understand sex (bodies). Gender was thus elevated from a concept that could explain the 'female trapped in a male body', or provide a criteria for the correct sexing of the intersexed body, to a conceptual framework within which individuals achieved a sexed subjectivity. Neither Rubin, nor Kessler and McKenna, or the theorists who followed their lead, historicized the concepts of sex or gender by examining the epistemological roots of each term (Haraway, 1991). It was not until social theorists and feminists[11] began to critically examine science, and the ethos of a positivistic objectivity assumed in science, that the associations of the biological with the social in the construction of concepts like gender, came under a scrutiny that could examine the history and epistemology of 'normal' that constituted those concepts (Ussher, 1994)

And the Work Goes On ...

It is necessary to be somewhat selective in following the trajectory of theory on sex and gender forward into the 1990's. In this section I will briefly discuss gender theory constructed from my reading of review essays, and writings on the use of gender in social and feminist theory across various perspectives, and disciplines.[12] This will provide a context for the pre- 1955 historical narrative that follows in Chapters Two to Four, and the interpretation of the historical narrative in Chapter Five that ties the pre-1955 and post 1955 narratives together. Donna Haraway (1991) describes the explosion of sex and gender differences discourse in sociological literature after 1970.[13] I identified 29 social science theoretical frameworks (e.g.: World systems, social learning, rational choice) for research and theory on gender; of those about 10 included research and theory directly related to sex/sexuality (e.g.: sexology, postmodern, psychoanalytic). The concept of gender took on the enormous burden of explaining any social phenomena where a 'sexed'division of humans was appropriate, from the victimization of women as women, to patterns of development in less developed sectors of the world. From the beginning of the twentieth century social theory and research incorporated ideas of gendering, under the topic headings sex role, sex difference, sex identity, and sexual orientation. Much of this work was located in the biological and medical sciences of genetics, endocrinology, embryology, and sexology. This work interacted with, and influenced, the social science disciplines of anthropology, sociology and psychology. Following the invention of a concept of gender as distinct from a concept of sex, gender theory appears to divide into five major streams: social theory using gender as a category, or variable for analysis of micro and macro social issues; specifically feminist theory where gender became the central analytic tool by the mid 1970's; psychological research on gender differences in ability, personality and behaviors; sexological studies that used gender to analyze homosexuality, transsexualism, and tranvestism; and a more philosophical and literary stream centered on gender issues in subjectivity, ethics and epistemology.

As the concept of gender diffused across disciplines, its definitions multiplied, often blurring sex and gender distinctions so that the two words came to mean the same thing. The specificity of sexed and sexualized bodies discursively disappeared into psychoanalytic frameworks, pornography wars, and emerging lesbian and gay studies, all of which tended to pit essentialism and constructionism against each other. Women of color, cultural minorities, the disabled and the disadvantaged pointed out the limitations of analyses that focused on gender to the exclusion of race, class, ability and sexual orientation. By the late 1980's it was also apparent that the concept of gender was cooptable (Gatens, 1991).

Anti-feminists, sociobiologists, functionalists, and fundamentalists all adopted gender. They were able to turn this concept back against ideas of liberation and equality largely because of two tendencies in the theorizing of gender in the social sciences. The first tendency neutralized the sexed/sexualized body under a barrage of statistical data focused on masculine and feminine differences in characteristics, abilities and behaviors; a direct inheritance of Social Darwinism and eugenics that fused the body with the social. The second tendency repeated another heritage from the nineteenth century, the valorization of female/feminine characteristics as a special way of being. This tendency opposed the first tendency by reinforcing a body/social split by removing the female body and sexuality from discussions of the effects of gender on women. Because disciplinary boundaries restricted the entry of a multidisciplinary feminist scholarship into sociology and psychology, these two tendencies were able to take root without the contradictory evidence from biology, history, philosophy and literary studies. Anti-feminist research and theory was very easy to construct when concepts were tied to stereotypes and statistics that could be manipulated in any direction. The introduction of qualitative research on gender issues had limited success in dislodging an anti-feminist rhetoric that could claim its legitimacy in 'real', objective science. On the whole, by the late 1980's gender became a tiresome concept; analytically limiting, ahistorical, and exclusionary in its assumptions of universality (cf. Grant 1993; Scott, 1988; de Lauretis, 1987). Theorectical writing on gender, in the late 1980's, began seriously questioning the relevance and usefulness of this concept.

By the early 1990's, under the influence of the work of Foucault, Continental theories of sexual difference, a renewed sexology, postmodern/poststructuralist perspectives, gay/lesbian/queer theory, and a revival of interest in intersexuality spurred by the emerging voices of the transgendered and transsexual, the theoretical focus turned back to the sexing and sexualizing of bodies, and the historical relationship between sex and gender. Steven Seidman (1992) locates this re-emergence of the body in social theory as an artifact of the 'new'[14] identity based social movements where the body, body parts, and body functions were important elements of those identities. This thesis is located within the reemergence of attention to the sexed and sexualized body. My aim in the historical narrative that follows is to take a long view, to reach back to the beginnings of discourses on the body that separated male from female, to search for points of linkage between the structuring of bodies and the enforcement of genderings, and situate this history within the development of a social science.

NOTES

1. The title of this thesis is meant to summarize the task; I am both 'queering' (spoiling, putting out of order) and 'querying' (questioning) the concepts of sex and gender.

2. In general this discussion will accept the following definitions as the arbitrary consensus of the dictionary format that most people would refer to if in doubt about meaning.
gender: 1. grammer, a system of classification of nouns and related words corresponding to the two sexes as masculine and feminine, or sexless as neuter or common 2. a social rank, kind or class 3. informal/colloquial, esp. feminist, a euphemism for a person's sex to emphasize the cultural over the biological. (The Concise Oxford, 1990; Gage Canadian, 1983)
sex: 1. either of the two categories, or divisions of male and female by which living organisms are divided according to their reproductive function or chromosomes 2. the biology of a person 3. sexual intercourse 4. genitals (The Concise Oxford, 1990; Gage Canadian, 1983; American Heritage, 1992)
sexuality: 1. quality of being sexual, or having sex 2. possession of sexual powers 3. sexual intercourse (The Concise Oxford, 1990)
The normative value of heterosexuality is apparent in each of these definitions. The etymology of these terms is also revealing. Gender: Latin, genus; race or kind. First used in English as 'kind', or as grammatical 'masculine/feminine' in 14th century. Sex: Latin, sexus, secus; sex, sexes. First used in English as 'male/female' in 14th century, associated with reproductive organs, 17th century, associated with type of social action or morality, 19th century (Karl Pearson), associated with sex-change, 1946. Sexuality: Late Latin (post 5th century, specifically Augustine), sexualis. First use in English as 'being sexual, or possessing sexual powers', 19th century. See The Oxford English Dictionary, second edition, 1989. Oxford: Clarendon Press.

3. See C. Wright Mills, 1959. The Sociological Imagination. New York: Oxford University Press.

4. I am using the term invention rather than construction, for reasons that will become clear as the narrative unfolds. The Concise Oxford Dictionary, 1990; invent: create by thought, concoct, often as a fiction.

5. Bernice Hausman (1995:79) suggests that, " binary gender could be enforced through the material production of sex" at the point when medical technologies could provide one sex for the hermaphrodite/intersexed (i.e.: 1950's). Through the historical narrative, I will demonstrate that several technologies were involved in the 'production of sex', and used to enforce a binary gendering from at least 600 BCE.

6. John Money, Joan Hampson, John Hampson. 1955. "Hermaphrodites: Recommendations Concerning Assignment of Sex, Change of Sex, and Psychologic Management" in Bulletin of the John Hopkins Hospital. Volume 97. cited in Hausman, 1995.

7. There is some confusion of categories here in that initially Stoller thought he was working with an intersexed individual called Agnes, who later turned out to be a male-to-female transsexual. Since his later work did deal with transsexuals, I am mixing the categories for clarity.

8. Sigmund Freud, 1905. Three Essays on Sexuality, cited in Stoller, 1968:vii.

9. This notion of gender as a managed achievement was more fully explicated in Suzanne Kessler and Wendy McKenna, 1978. Gender: An Ethnomethodological Approach. They claimed that our understanding of gender frames our perception of sex.

10. Germaine Greer, 1971, The Female Eunuch; Kate Millett, 1971, Sexual Politics; Nancy Chodorow, 1978 The Reproduction of Mothering; Michele Barrett, 1980, Women's Oppression Today.

11. See for example Reed, 1978; Fox Keller, 1985; Harding, 1986.

12. The ideas in the discussion that follows were drawn from: Flax, 1990; Cornell, 1993; Wittig, 1985; Nicholson 1986, 1994; Braidotti, 1994; Delphy, 1993; Chanter, 1995; Lorber, 1994; Siann, 1994; Haraway, 1991; Salamon and Robinson, 1987; England, 1993; Scott, 1988; Golonmbak and Fivush, 1994; Todd and Fisher, 1988; Jordanova, 1989;

Rhode, 1990; Epstein, 1988, Farganis, 1994. See References for complete citations. For a review of twentieth century theory on gendering pre-1950's see Viola Klein, 1946/1989, The Feminine Character: History of an Ideology. Third Edition. New York: Routledge.

13. Haraway (1991:136) states that "the occurrence of the word gender as a keyword ... in Sociological Abstracts" went from zero in the 1966-1970 period to 724 entries between 1981 and 1985. However, this 'explosion' was low compared to Psychological Abstracts.

14. I have argued elsewhere that body identity social movements are not 'new', but rather have their beginnings in the Medieval heresies. Unpublished paper, 1994.

Chapter II. Two Seed/One Seed?: The Creation of 'Sexes'

In this chapter I will present the portion of the historical narrative that establishes the conceptual systems that framed the beginnings of the concepts of masculinity, femininity, male, female and sexuality up to the late Middle Ages. The first section will examine the development of medical and philosophical discourses on the body and mind/soul between the seventh century BCE and the second century CE. The second section will examine the shift in the conceptual framework for the production of knowledge about the male and the female during the early centuries of Christianity. The final section of this chapter will examine the synthesis of ancient knowledge about the male, female and sexuality produced by Churchmen, that prevailed as a counter-knowledge within the emergence of a more science based anatomy and physiology.

When the Christian belief system was recognized as a State religion by Theodosius in 395 CE, Latin became the official language of the Roman Church. Literacy in Greek and Hebrew had diminished among the Christian Fathers as they concentrated on adapting their theology to the Roman state apparatus (Price 1992). With the defeat of Rome in 410 CE, and the subsequent chaos of repeated invasions and wars, the Roman Church became isolated from the Mediteranean and Arab world in which it had originated and developed its cult status. Medical and philosphical texts, written primarily in Greek, were no longer available to theologians as primary sources. The men who had the power to formulate Church doctrine, including ideas about masculinity and femininity, and the relative status of the male and female bodies, worked from partial translations, commentaries and glosses (Caddon, 1993; Jacquart & Thomasset, 1988). As the narrative will show, the Latin that developed within the Church, was limited to ancient references, and localized changes, by the destruction of Roman culture, and the isolation of the European Church from the Eastern orthodoxies. Translations from Greek and Hebrew became less exact with time, which affected the exactness of terms to describe the human body, and body parts. This often led to misrepresentations of male and female anatomy which in turn would affect how the body could be seen, once human post- mortem dissection began in the fourteenth century. The vocabulary that I am using to develop the historical narrative is also limited by the English language which cannot capture the fine distinctions contained within the variation in Latin words used for the concepts that I am discussing. For example, where I am limited to the word 'woman', Latin would distinguish between the unmarried adult, femina, and the married adult mulier, and then create further disinctions with word inflections according to social status, race and sexuality. Where vocabulary issues appear problematic, I will describe these distinctions.

Beginnings

> When the Olympian gods had brought their struggle to a successful end,... Mother Earth advised them to invite Zeus to be king and lord over the gods. Power and Dominion belonged to him alone. (Hesiod, c.750 BCE, 1953 translation, pp:64 & 78)

In the macrocosmic mythology that surrounded the microcosmic human world of archaic and Classical Greece with gods and goddesses who represented human characteristics and behaviour, the female principle had willingly given over her authority to the god-repesentation of the male principle. In this way Hesiod justified masculine supremacy in the household that extended to masculine supremacy in the creation of the polis. The division of masculine and feminine principles within the social world led to increasing divisions of space into areas of masculine dominance, and feminine obedience; the beginnings of the concepts of public and private, that complimented divisions of labor within human activity (Blundell, 1995). Xenophon (430-357 CE) in his text on estate management Oeconomicus, reinforced Hesiod's mythological divisions by declaring that separate spheres for males and females was divinely ordained by their body functions, and integrated into law based on natural virtues (Allen, 1985). Masculine and feminine were thus linked to both function and virtue, and function and virtue in turn linked to prescriptive social characteristics and roles (Merchant, 1983). The body was a relative latecomer in this network of meaning systems, not appearing to matter until after the conceptual reorganization of knowledge production that I will describe below. Once the concepts of male and female were introduced as meaningful divisions of humanity, the organic connection of body, masculine and feminine principles as spirit/soul, and culture was further constructed within a conceptual framework that attempted to maintain a balance between the macrocosmic forces of the universe, and the microcosmic world of human health and activity. Within this larger, and more rational framework, there remained the tendency to interpret the world in terms of mythological principles, and timeless essences (Tarnas, 1991; Jacquart and

Thomasset, 1988).

Beginning around 600 BCE, a change occured that turned human thought away from the mythical realm toward the natural world. The idea was that observable phenomena were guided by something inherent in the object observed, not by the gods and goddesses. To understand a tree, one must look at the tree, not refer to the characteristics of the god/goddess that represented the tree. Two streams of philosophy originated during this time, the search for meaning in the material elements of the natural world, and the search for meaning in the immateriality of pure forms; the spirit of intellect, and numbers (Wertheim, 1995). Both streams of explanation sought a harmony between the cosmos, and the realm of human activity through the use of reason. Reason became the essence of human nature, and the privileged method of the search for wisdom (Allen, 1985). The remainder of this section will examine the specific thinkers whose works provided the foundation for thought about male, female, sexuality and the principles of masculine and feminine through the developemnt of Christianity, and into the development of European science.[1]

Pythagoras of Samos (582 - 500 BCE) sought a naturalistic harmony in the properties of numbers. His work was influenced by Delphic mysticism, Egyptian numerology and the Zorastrian dualism of good and evil forces that also influenced gnostic forms of Christianity. In 540 BCE Pythagoras established a community in Southern Italy to study the mystical properties of mathematics and cosmology. The community included women as both learners and teachers, but the women and men were segregated. Under Pythagoras numbers were anthopomorphized gods with ethical characteristics that could be used to predict cosmic and human behaviours, and establish cosmic-human harmony. The 'decade', the whole numbers one to ten, were particularly sacred. The odd numbers represented masculine, good, heavenly, and the immaterial. Even numbers represented the feminine, evil, earthly and material/matter. For the psyche to transcend nature in order to know it, it must transcend matter; that is reject the feminine. Through this logic, if human transcendence was to be achieved through the understanding of mathematics and the application of mathematics to explanations of the cosmos and the natural world, then mathematics was essentially an enterprise of a masculine psyche (Wertheim, 1995). The important point within Pythagorean thought, that would influence the use of numbers in 'science', was that the number constituted an object. Something was a material 'thing' if it could be counted, or in the more modern sense, if it could be given a numerical value.

Pythagoreans saw reason as an immortal part of the soul, unrelated to temporal bodies. Therefore the female body could have a masculine soul which could manifest itself only under conditions of personal chastity and obedience to male rule. Women did participate in the philosophy of mathematics but not freely as women. We see here the first direct reference to difference in the masculine/feminine mind/soul that influenced a division of labor, and the spatial location of material bodies in intellectual work. Pythagorean thought influenced Plato, but was ultimately overshadowed by Aristotleian materialism and natural philosophy (Wertheim, 1995; Lloyd, 1984). However, aspects of Pythagoreanism cast a long shadow across Christian doctrine in regard to the concepts of masculine and feminine, and would re- emerge to influence the conceptualization of the cosmos in the development of science.

Within the geopolitcal frame chosen for this historical narrative, the second conceptual framework that I am suggesting as a foundation for knowledge about, and connections among, masculine/feminine and male, female and sexuality is contained in the work of Hippocrates. The collection of texts, commentaries, and summaries refered to as the Hippocratic corpus, was written down between the fifth and first centuries BCE. This collection of texts would continue to influence knowledge about the male, female and sexuality throughout the Chistianized west until the nineteenth century (King, 1994, Allen, 1985). As with all of the medical-natural writings to be examined in this chapter, knowledge about the body within the Hippocratic corpus was divided into anatomy and physiology/embryology. The two did not necessarily present a coherent system either within one set of discourses, or across discourses.

Anatomy was a way of describing the structures of the flesh, while physiology described processes that occured within the body, or in the creation of new bodies. Knowledge about the body, and theories based on this knowledge, developed from personal observation and treatment, and/or the dissection of animals.(Jacquart & Thomasset, 1988). The basis for the structure and health of the human body was the balance between the essential cosmic elements of fire, water, air, and earth, and the essential humours and fluids that corresponded with those elements and influenced body types and temperaments. Fire was associated with dryness and heat; water with coldness and moisture; air with heat and moisture; and earth with coldness and dryness. When the descriptive categories of each of the humours were brought into line, opposites were established with heat and dryness on one side and coldness and moisture on the other. When this opposition was situated within the mathematic-philosophical context of the Pythagorean Table of Opposites[2] heat and dryness were associated with light and maleness, coldness and moisture with dark and femaleness (Lovibond, 1994; Allen, 1985).

For the Hippocratics, the fundamental anatomical difference between the adult male and female was the texture of the flesh derived from the influence of the humours. The moisture and coldness associated with femaleness made her flesh soft, spongy and porous, while the heat and dryness associated with maleness made his flesh hard and muscular. The humours also influenced physiological sex-difference. The spongy, porous nature of adult female flesh caused her to absorb excess moisture which put her body out of balance. To correct that balance the female expelled the excess moisture as blood every month. The male had no need for this expulsion process. Therefore in adulthood, the physiological difference between the male and the female was the presence of menstruation.

According to the Hippocratics, the pre-menarche young female was not differentiated from the young male. She was seen as being in both a state of potential ripeness, and in the state of wildness associated with an ambiguous (hermaphroditic) body. Maturity into womanhood occured first with the onset of the menses, and second with the taming of wildness by male penetration and subsequent childbirth. The post-menopausal woman's body became dry and cold as it ceased to absorb and expel mositure. She therefore became male-like, existing outside of social categories as neither man, nor woman (King, 1994). The differential status of the adult male over the adult female, therefore of man over woman, was constituted through mythology, economics, anatomy and physiology as each set of discourses refered to each other, and to the structure of the universe, for its authority.

The second part of Hippocratic theory of physiology, the process of creating new bodies, would echo down the centuries, and have a profound effect on the conceptual construction of the male, female and sexuality. Two questions received attention in terms of procreation. First, did the female produce seed that was necessary for conception, and if so, was the ejaculation of this seed accompanied by the same degree of pleasure experienced by the male during ejaculation. The second question concerned the process by which a child was conceived as male or female. These issues were dealt with in the text *Regimen*, attributed to the Hippocratic school at Cos (King, 1994; Allen, 1985).

The theory that sought to explain these processes, was developed from the idea that sperm was made up of the four fluidic humours[3] of the body. In the rubbing of the genitals during the sex act, heat was produced that drew the fluids together in the male and female testes[4] where they were concocted by the excitation of orgasm, and then ejaculated. The female ejaculate containing both male and female seed was expelled into the uterus, the male ejaculate, also containing male and female seed was expelled from the penis into the 'tube' that provided access into the uterus. Both sperms were necessary for conception, and both the male and female had to experience orgasm to produce sperm. Within both male and female sperm, the male seed was stronger. Therefore depending on the quantity of each sperm produced in the act of sexual intercourse, the male seed or the female seed might prevail and result in a male child, a female child, or a hermaphrodite. "These three kinds of men" are formed as a result of the conflict between male and female seed for mastery (*Regimen*, 4th century BCE, quote in Allen, 1985:51). The Hippocratic two sperm, two seed theory encompassed the issues of the process of conception, sexual pleasure, and the future sex of the fetus.

> We must not forget that this pleasure (intercourse), is held to have been granted by nature to male and female when conjoined for the work of procreation; the crime of male with male, or female with female, is an outrage of nature, and a capital surrender to lust. (Plato, *Laws*, quoted in Allen, 1985:65, brackets mine)

Plato's (428 - 355 BCE) philosophical texts were not concerned with medicine or the natural world as such. He did, however develop a systematic analysis of the concepts of masculine and feminine at the cosmic level of the soul and temporal level of human activity that would influence Aristotle's natural philosophy, Galen's medical theories, and aspects of Christian theology. At the cosmic level, in the ceation of souls, the masculine principle represented active Form, virtue, and wisdom, the feminine principle represented passive Matter, the imperfect, and ignorance. At the level of the life-world Plato's views appeared more egalitarian. The masculine or feminine soul might fall, through reincarnation, into either the male or female body. Therefore, as in the

Pythagorean system, the qualities of masculine and feminine were not necessarily linked to the materiality of the body (Allen, 1985; Lloyd, 1984). This splitting of body and soul generally led to negative views on sexuality because Plato viewed the hungers of the sex act as unwholesome instincts that should not dominate over the higher function of reason, unless the purpose was procreation. Platonic thought would also re-emerge in the fourteenth century, and influence the development of science, and views on masculinity, femininity and the male and female body.

> A woman is as it were an infertile male; the female, in fact, is female on account of inability of a sort, it lacks the power to concoct semen ... because of the coldness of its nature.(Aristotle, *On the Generation of Animals*, quote in Blamires et al, 1992:39)

Aristotle (384 - 322 BCE) was above all else, an empiricist, and logician. For him, observation was the key to truth. Aristotle's theories on sex-difference were a direct reflection of Athenian society during his time, and were well situated within the Greek world view of essential harmony betwen the cosmic and human dimensions of the natural world. (Jacquart & Thomasset, 1988). Aristotle vigorously rejected both Plato's metaphysics of the soul, and the Pythagorean metaphysics of the number, bringing the soul (Form) back into the body (Matter) as a single entity (Lloyd, 1984). Aristotle was not a physician, and therefore did not dwell on anatomical issues to the same extent as the Hippocratics. Rather, he assumed the theory of the humours, and applied this to his observations, giving heat the superior value. The coldness of the female meant that her reproductive anatomy differed from the male's only to the extent that her organs of generation remained incomplete, and hidden within her body. This led to his conclusion that the female was a mutilated, or deformed male. External female genitalia (the specifically womanly parts that in appearance were not homologous to the male), were treated by Aristotle in a rather vague way. However, as Laqueur (1990:33) suggests, a portion of Aristotle's *History of Animals* reveals some awareness of female pleasure situated in her genitals. Aristotle speaks of "a small duct which is placed above the place through which women urinate" and goes on to say that " this is why, when they are eager to make love, this place is not in the same state as it was before they were excited"

As an observer of nature, Aristotle's theoretical works on sex difference, and sexuality, focused on reproduction, and the primacy of form over matter within that process. His argument was a radical departure from previous thought in that he categorically denied the two seed theory (Allen, 1985). Since the female lacks heat, she cannot concoct seed that would contribute to the form of the fetus. In that sense the female was infertile. Within the uterus the female provided matter in the form of blood that was purified by the action of the male seed. This purified blood was then activated by the male seed in a process of coagulation that provided the form of the embryo. The male seed was the prime motivating cause of conception, explicitly due to the heat of the male body. In keeping with the Hippocratic theory, the sexing of the child occured within the conflict of the male seed striving for mastery. In Aristotle's theory this struggle for mastery was male seed over female matter/blood. If the male seed was weak, and lost the struggle, a female child resulted.

> This is the reason why the female was made cold, and the immediate consequence of this is the imperfection of parts, which cannot emerge on the outside on account of the defect of heat. (Galen, 2nd century CE, quoted in Blamires et al, 1992:40)

Galen (131 - 201 CE) trained in the Greek tradition at Alexandria, was the court physician to the Roman Emperor, Marcus Aurelius. He was the first to attempt a synthesis of the traditional theories of natural philosophy and medicine from Aristotle and the Hippocratic corpus. It was his work, much of it written in Latin, that would be used by Christian physicians and theologians as the Latin Church developed over the next 1000 years (Allen, 1985)

Galen, like the Hippocratics and Aristotle, viewed the body and its processes through the lens of essential elements and humours that harmonized human life with the cosmos. Like Aristotle, he was an empiricist rooting his medical knowledge in observations of matter within nature, and from knowledge he aquired in the dissection of monkeys (Jacquart & Thomasset, 1988). He extended Aristotle's view of female anatomy to the analogy of outside-in. The pattern of female reproductive anatomy, vagina/testes/uterus was homologous to the male penis/testes/scrotum. The heat of the male caused the male organs to escape to the outside of the body. The external female genitalia or 'womanly parts' were partially inserted into the homology by designating the labia as the female equivilent of the penile foreskin. Galen likened the clitoris to the uvula (back of throat) as an anatomical 'door' that protected the uterus (and fetus) from excess air and moisture (Laqueur, 1990:4,37,45). Galen does not appear to give the clitoris the role within female arousal that Aristotle suggested. Although Galen supported Aristotle's conclusion that female anatomy was imperfect, and inferior, he did not go as far as describing it as deformed mutilation. Contrary to Aristotle, Galen supported the Hippocratic notion of female seed, and the necessity of female excitiation for conception. The source of female arousal was the link between female seed and desire. Female seed offered "no small usefulness in inciting the female to the sexual act" (Laqueur, 1990:45). Galen qualified the importance of this seed and its relationship to conception. He saw that taken to its logical conclusion, the presence of an active female seed within the uterus, in the presence of the necessary material substance (purified blood), might mean that the female could impregnate herself without the male. He proposed that the female seed was extremely weak because the female was too cold to concoct active seed. Therefore female seed contributed to the form of the fetus only in that it helped give life to the material activated by the male seed.

Female anatomy was imperfect, and the female seed was weaker than the male seed, but women were essential for the process of conception beyond being mere vessels just as the feminine principle had been essential in the creation of the universe. To name the female as a mutilation would negate that function, and disrupt the harmony between the macrocosm, and the microcosm. The sex of the child was once again a matter of conflict. If the quantity, and quality of male seed was weak, the female seed could achieve mastery and produce a female child (Cadden, 1993; Blamires et al, 1992; Jaquart and Thomassett, 1988).

We can now summerize the prevailing view of sex-difference. Whereas the Pythagoreans had situated masculine and feminine principles in non-differentiated reason, but male and female bodies in a temporal hierarchy, Hippocratics had located sex difference in the moist/dry texture of the flesh, Plato in the cosmic principles of form and matter in relation to the creation of souls, and Aristotle in the activating force of heat and its effect on form-matter, Galen tended to situate sex difference in the force of heat specifically related to reproductive function and roles. With the exception of Pythagoras and Plato, the writings that established the difference between the concepts of male and female used heat as the crucial factor determining the relative value of the male over the female in the anatomy and physiology of humans, and within the natural processes of conception and the sexing of the child.

Within the discourses on sex difference outlined above, the focus of sexuality was on procreation. It would be incorrect to leave the impression that during this period, non-procreative sex acts received no attention. As we saw in the quote from Plato's Laws, sexual activity, beyond the requirements for generation of the species, was recognized. The level of tolerance for non-procreative sex acts generally paralleled conceptualizations of masculine and feminine, and the knowledge constructed about the male and female bodies (cf. Cantarella, 1992; Boswell, 1980). Pederasty, the sexual mentorship of young men by adult men, was a part of the culure of the guardian/citizen class of Athenian society. Beauty, exemplified by the nubile young male, was a virtue to be sought. The mentorship of a beautiful young man reflected well on the virtue of the older man. Strict rules of conduct controlled the exchange between partners, at least in theory (Cantarella, 1992). Pederasty, within this Greek context, should not be confused with paedophilia, or homosexuality. Neither same sex acts between adults, nor child sexual abuse, were particularly tolerated within the Greek state, or within Roman law (Blundell, 1995)

The degree of 'crime' involved in sodomy (male) or tribadism (female) was based on a differentiation between the passive penetrated partner, and the active penetrator who discharged sperm/seed inappropriately. The issue was both waste of seed, and the crossing of boundaries between masculine and feminine activity and space, where the penetrated man was feminized, and the penetrating female was masculinized,[5] or where private acts occured in public space. Male same-sex acts received more attention, because the knowledge producers and law makers were men, but also because female same sex acts did not involve issues of citizenship, lineage and property; in other words were private acts outside of notions of public space (cf. Cantarella, 1994, Boswell, 1980). Other non-procreative forms of sexuality: masterbation, fornication, prostitution, and male- female oral and anal sex, would receive more attention in Judeo- Christian thought as moral issues, than they did in Greco-Roman antiquity.

In the limited discussion of female same-sex acts, there resides a contradiction that would emerge more clearly in Christian medical-theological discourse. As Traub (1995) points out, there is an assumption of female generated genital desire and pleasure in discussions of tribadic acts, contradicted by medical/natural philosophy 'facts' that generally denied any female genital desire and pleasure in male-female coitus. I would argue that this contradiction arises because there is nothing in the structuring mythology of the Greco-Roman world view to associate either the male or the female with an essential sexuality. Sexuality in its broad definition as desire/pleasure, as well as procreation, did not therefore provide a basis for sex difference in the Greco-Roman world (Blundell, 1995)

There is one further piece of the sex-difference discourse that needs to be elaborated. The Hippocratic corpus makes specific reference to the hermaphrodite as being one of three kinds of 'men'. As a living being with both sets of generative organs, or as a psychic representation of a primal, or utopian, mixture of the masculine and feminine, the hermaphrodite is the constant shadow of sex-difference theory and discourse. As Delcourt (1961) explains, the majority of human creation myths begin with some form of unitary void or essence within which resides the male- female potentiality for a created earth-sky universe. In order for creation to occur, either the hermaphroditic essence must impregnate itself and give birth to the cosmic elements, or this essence must be split into male and female principles, or first causes, who copulate and produce those elements. The hermaphrodite (or andogyne) is therefore a common archetype in creation mythologies. One exception to this general rule is the Biblical Judeo-Christian creation story in which a single male god generates the universe without a corresponding female principle. As a result, in Christain thought, the hermaphrodite/androgyne tends to be located outside of normative discourse on sex-difference in the role of the "other", or the "unspoken". The she/he, or man-woman as shadow, comes into clear focus as a structuring agent for sex-difference and sexuality, fades to metaphor, then emerges clearly again. Regardless of the degree of visibility, the hermaphrodite has never been completely absent from the construction of knowledge about sex difference.

It is clear within the works of all the physicians and philosophers discussed above that the boundary between male and female was not perceived as absolute. Heat can cool, flesh can harden, the male seed can fail to achieve mastery, and the penetrator can become the penetrated. In the Greco-Roman world differences between the male and female body were structured through the characteristics and behaviours represented by ancient concepts of superior/masculine, intermediate/hermaphrodite, and inferior/feminine divisions of labor (Illich, 1982) and public and private spheres (Allen, 1985). The human species was of one kind, man. The mythology and medical-theoretical discourses I have examined in this section on beginnings, are the foundation upon which knowledge about the male, the female, and sexuality was constructed, and reconstructed, in Western cultures until human dissection began in the late thirteenth century (Jaquart & Thomasset, 1988). As we shall see in the next section within the Christain world view, the mythology changed from a polytheistic system of masculine and feminine, to a monotheistic system where the essential essences were contained within a universe governed by a single masculine god. The medical discourses from antiquity were incorporated into this new mythology. In this way, concepts were reorganized, but the conceptual framework remained teleological in that the theories of medicine and theology always fed back to cosmic necessity.

The Christian World: The First Six Centuries

> Simon Peter said to them: 'Let Mary go out from among us, because women are not worthy of the Life.' Jesus said: "See, I shall lead her, so that I will make her male, that she too may become a living spirit, resembling you males. For every woman who makes herself male will enter the Kingdom of Heaven.' (Logion 114, Gospel of Thomas, c.160-225 CE, quoted in Aspegren, 1990)

Once the Jesus movement left the borders of the tiny country in which it developed, this cult of personal salvation through belief in Jesus as incarnate god, baptism, and good works, moved east around the Mediterranian, and west across North Africa, becoming increasingly Hellenized, and fractured into belief communities. The epistles of Paul (a converted Hellenic Jew), written about 40 - 60 CE, served as the documents of authority for the questions and commentaries of the Greek and Latin followers of the apostolic line established by Peter, that became the orthodox Roman Church. Other texts, originating in an oral tradition; the synoptic Gospels of Mathew, Mark and Luke, the Gospel of John, and the legends, stories and sayings of Jesus attributed to other disciples, followers or belief communities, were written over a period extending from about 80 CE to 225 CE (Aspegren, 1990). Parts of this large textual enterprise became canonized, along with the epistles of Paul, into the New Testament. The writings that were removed, neglected, or adopted by non-orthodox sects, are generally refered to as apocraphyl, or gnostic (Aspegren, 1990, Pagels, 1979). The earlier Hebrew texts, now refered to as the Old Testament, were also used as a source of authoritative knowledge. Theology developed from this assembled scriptural base.

It is important to keep in mind that the Christian belief system was not a unified religion, even after the bureaucratized Latin Church became the official religion of the Roman state. The Roman Church coexisted with both the Eastern orthodox sects, and with its non-orthodox variations (heresies). It was not until the tenth century that the universal Catholic Church achieved hegemony throughout Europe (Jones & Pennick, 1995; Le Goff, 1988). As the Church colonized the land mass of Europe, it had to make itself intelligble to the indigenous peoples; Celts, Franks, Norse, and Germanic tribes. In this process, the Church absorbed the 'pagan' beliefs and rituals that corresponded to established Church doctrine, or demonized those beliefs and rituals that it found abhorent. Indigenous concepts of masculine and feminine, and knowledges about the human body were largely buried under the weight of Christian doctrine.

Women, and their relative status within heretical and 'pagan' belief systems, were a constant problem for the early Christian Fathers, and male theologians. As orthodox Christianity sought to avoid persecution by becoming thoroughly Roman (and thereby male centred), it cast off much of its egalitarian origins in communities of women and men who ministered equally to followers (Torjesen, 1995; Cloke, 1995). In order to justify an orthodxy that disallowed women in positions of power, it was extremely important for the Church to have available the ancient medical-philosophical texts to act as an additional source of authority for its own theologically based knowledge of the male, the female and sexuality. As discussed earlier in the chapter, medical knowledge and theories of sex difference became somewhat limited by problems of language and translation, but as we shall see, what remained available fit perfectly with the Judeo- Christian myth, and Christian orthodox doctrine.

There are three issues that have to be considered in the first centuries of Christianity in terms of constructed sex difference; the Christian-Gnostic tension, the concept of the Fall and original sin, and the creation of a totally new social sex category, the virgin or chaste woman. Although these issues do overlap, I will briefly deal with each one separately. The most serious threat to the development of a Christian othodoxy with wide appeal was the initial ethic of asceticsm grounded in a gnostic belief system. Gnostics, and the various Encratic Christian sects that adopted all or parts of the gnostic system, believed that the Hebrew god of creation was actually an evil demiurge who created matter in order to trap the pure spirit emboddied by the real god; a transcendent First Principle incorporating within itself a unity of masculine and feminine (Salisbury, 1991b; Aspegren, 1990; Pagels, 1979). Here we see the influence of Pythagoreanism. All earthly creatures (matter), including humans, were evil. Each child born was more matter that inevitably led to a spread of sin, death, and decay before the imprisoned spirit could be released. The only way to return the universe to pure spirituality, and re-establish harmony, was for all creatures to remain celibate, until matter died off. Radical Encratism meant sexual continence for all believers, male and female. The early Desert Fathers, and their female mystic counterparts emboddied Radical Encratism in anorexic chastity, walled into caves, or rooms in urban settings. For reasons of simple expediency, the Roman Church moderated Encratism so that sexual continence was only expected for an ascetic elite. This asceticism became the foundation for the monastic system, the priestly caste system, and for the concept of the chaste woman/virgin (Aspegren, 1990). Gnostic belief, with its unity of masculine and feminine within god, also threatened an orthodoxy seeking to emulate the Roman social organization based on the authority of pater familias/patriarchy (Merchant, 1983).

The second factor that affected theological views of sex difference, was the doctrine that grew out of the myth of creation in Genesis.[6] The general argument for a differentiation between male and female focused on two interlocking ideas. The first was the 'imago dei'. The male was created in the image of the divine, while the female was created in the image of man. The female was secondary and inferior in that she reflected god's work only through her relationship to the male. The second source of sex difference lay in the female's disobedience to god's command not to eat from the tree of knowledge. The female took the initiative, ate, and then tempted the innocent male. In this way the female was held responsible for the emergence of knowledge of sexual desire (Cloke 1995). It was not a particularly great theological leap to take the idea of female responsibility for sexual knowledge and the corruption of the male, to the view that the female emboddied sexuality, while the male in 'imago dei' emboddied the spiritual.

Women's nature was now tied to both an inferior body, and a tainted body; a body made abject by its active role in the initiation of 'original sin'. Female inferiority was grounded in the conclusions drawn from the anatomical and physiological knowledge in the Galenic synthesis; female taintedness was grounded in a creation myth re-constructed as Christian doctrine. For the Churchmen piety was linked to virtue,[7] a masculine characteristic Through baptism and good works, a woman became pious, and "the reward for being a virtuous female was seen as a negation of her original abject nature" (Cloke, 1995:212) To be virtuous a female must renounce her sex, as if she had become male (anthropos: a manly creature). This was both a de-sexing, and a fulfillment of Paul's hermaphrodtic statement that in Jesus there is neither man nor woman. To accomplish negation of an abject nature, a woman, as 'femina'/not yet married, or as 'mulier'/married, must become chaste; an asexual virgin. The path to this negation was the ascetic ideal.

In the anatomy and physiology of sex difference as synthesized by Galen, the female was distinguished from the male by soft flesh, lack of heat, menstruation, weakness, and by being a vessel for male semen/seed. The Christian ascetic life entailed severe fasting, sexual continence, long periods of solitary meditation, and a rigorous regimen of teaching and travel among Christian communities (Salisbury, 1991b) Using the Galenic medical logic, an ascetic life would probably mean that at the level of the body, female flesh would harden, menses cease, or become irregular thus increasing heat and reducing weakness, and sexual continence would remove any possibility of being a vessel for semen. Becoming male/masculine was a physical-medical reality as well as a state of virtue. In terms of the social, when a woman became a manly creature, she was released from future marriage, or marital coitus and childbirth, given access to literacy and learned communities, allowed to travel, and provided with a glorified social status as a pious independent virgin (Salisbury, 1991b). As both Salisbury (1991b), and Aspegren (1990) illustrate, this was unprecidented freedom for Hebrew and Greco-Roman women. Without in any way denigrating the profound faith involved, it is not surprising that a relatively large number of women took the ascetic virginal path to virtue, and used it to construct for themselves a positive image of the female.

However, as Cloke (1995) points out, this did not mean that the female-man constituted a separate 'sex'. She still possessed the 'womanly parts', now seen as the origin for knowledge of sexual desire, that ultimately defined her as the temptress whose sexual appetite destroyed men. Femaleness could be disguised but never transcended. For the Church Fathers during the first 400 years of Christianity, the foundation for sex difference was an essential sexuality. Sexuality as a concept was constituted through the female body, Biblical myth, and a particular reading of medical 'fact' that confirmed male centered theological doctrine. The conceptual framework remained the necessity for cosmic-human harmony; the cosmos now defined as god's creation.

> This lust assumes power not only over the whole body, and not only from the outside, but also internally; it disturbs the whole man, when the mental emotion combines and mingles with the physical craving, resulting in a pleasure surpassing all physical delights. So intense is the pleasure ... there is an almost extinction of mental alertness. (Augustine, City of God, quoted in Salisbury, 1991b:48)

> You created man male and female, but in your spiritual grace they are as one. Your grace no more discriminates between them according to their sex than it draws distinctions between Jew and Greek, or slave and freeman. (Augustine, Confessions, quoted in Allen, 1985:221)

According to Sr. Prudence Allen (1985:218) the writings of Augustine of Hippo (354 - 430 CE) were a "watershed" in the history of the concepts of male, female and sexuality; Joyce Salisbury8 (1991b:39) refers to these writngs as a "sexual revolution". Both descriptive terms suggest that Augustine turned the ideas of the earlier Church Fathers upside down. I have argued that the foundation for sex difference during the first 400 years of Christinaity was sexuality. In reversing ideas from earlier texts, Augustine shifted the context of this foundation from sexuality-continence to sexuality-power (Salisbury, 1991b). Augustine's work on sex-sexuality would be the primary theological authority on these topics for the next 800 years. In the earlier texts the concept of sexuality was grounded in the knowledge that had been constructed about the inferiority of the female body in relation to reproductive organs and processes, and in relation to the female role in the Fall. Sexuality was a totality of procreation and desire. Augustine separated sexuality into male-female sexual intercourse (procreation), and concupiscence (lust). He exonerated marital sexual intercourse as part of god's plan, and made concupisence, and all non- procreative sex acts, unnatural perversions. The 'revolutionary' aspect to this separation is that rather than situate lust in the female's essential nature, and 'womanly parts', Augustine re- centered lust in the male seed and penile erection.

He justified this bold stroke with a complicated argument that placed a blameless coitus as a natural event within Paradise. Coitus was blameless because it occured without an erect penis, or the itch of the male seed for release (orgasm). The sin in the Fall was not the male-female sex act itself. The sin was the disobedience to god that resulted in knowledge of lust, and the subsequent inability of the male to control his sex organs in the presence of the female. The female retained sexual shame for her share in the disobedience, but she was no longer the primary icon of sexuality. Augustine located the differential between the male and female, within human activity, in two characteristics of the female. First in female weakness exemplified by both her inability to resist the temptation for sexual knowledge, and her basic anatomy and physiology, and second in the her passivity as the natural, and essential, vessel for male lust. Weakness and passivity, aspects of femininity, made the female inferior to the male because both characteristics demonstrated a lack of power. In effect Augustine was prepared to rescue male-female sexuality within marriage from the dualistic tendencies of the earlier encratic Fathers, but he was not prepared to rescue women from the hierarchy of male-power, female-subordination entrenched in the Roman state as a sexual division of labor, and separation of masculine and feminine spheres of activity.. As the second quote reveals, Augustine's concept of soul refelected Aristotelian unity of form and matter, and a trace of gnosticism in the vision of an hermaphroditic soul (Lloyd, 1984).

In the matter of chaste women/virgins, Augustine also reversed earlier beliefs. He argued that the ascetic woman was not renouncing her flesh/sex, but rather was revealing Christian charity/love through austerity. It was a sin of pride to think that one could avoid the taint of a carnal nature, through personal choice. One was called by God's grace to lead a celibate life; a life that should be lived humbly within a friendship community. The independent virgin was reconstituted as a Bride of Christ. In 423 Augustine issued the 'Augustinian rule' for virgins that enclosed them in consecrated communities where the ascetic women took on all the duties normally associated with wives.[9] Now, instead of renouncing flesh, the woman seeking an ascetic Christian life was required to renounce first, any property (money, land), and then any claim to personal accomplishment (Salisbury, 1991b). An interesting footnote to this subjection of the chaste woman to male rule, may reveal the continuing anxiety about female sexuality. Within the letter that laid out the 'rule' for virgins, Augustine warned: "The love between you ... ought not to be earthly but spiritual, for the things which shameless women do even to other women ... are to be avoided ..." (Salisbury, 1991b:53)

From the Hippocratics to Augustine, over a period of nearly 1000 years in a relatively small geographic space, Western knowledge of the male, female and sexuality was constituted and re- constituted by men through mythologies, medicine, philosophy, and theology that all sought a harmony between human activity and the elements of the universe or the divine. Did women have a voice in the production of this knowledge? There is some evidence that there were women among the Hippocratic physicians (Blundell, 1995). During the fourth century CE, two women philosophers, Catherine of Alexandria (d. 307 CE), and Hypatia (370 - 415) also of Alexandria, spoke to the issue of the concept of the female (Allen, 1985). Catherine, a chaste virgin personified wisdom as female, and glorified her own identity as a woman. Hypatia, whose original work has been lost, is associated with neo-Platonic belief in the lack of difference between the male and the female in temporal existence. Both women were murdered. They were caught in the Christian-non Christian persecutions, and in the dangers that emerged in the fourth century when the Churchmen began to lose tolerance for women taking a public role in interpreting and teaching scripture (Allen, 1985).

Greek Thought Returns to the Latin West

Beginning around the year 1000, relative peace returned to Europe. The "barbaric" invasions occured less frequently, and shifting empires began to settle into a feudal economy. Changes in agriculture improved general nutrition, so the population started to increase. Population growth meant that some people could not be accomodated on the land. Towns grew and markets appeared. New classes of nobles, knights, traders, and skilled craftspersons fractured the old worshipper, warrior, worker estate/class system (Blamires et al, 1992). Within these general socio-economic changes a conceptual re-organization began as both Churchmen and laity turned their attention once more to the development of culture and learning (Price, 1992)

Throughout its history the orthodox Latin Church had to work out its doctrine and rituals against the oppositional beliefs and practises of the 'paganisms' of indigenous peoples and 'barbarian' invaders, Judaic thought, the Byzantine orthodoxy, and heretical Christian sects. In the seventh century a new opposition appeared with the rise of the Muslim faith, and its subsequent spread throughout the Arab world, the 'Holy Land', North Africa, and the Iberian Peninsula. Between the tenth and the thirteenth centuries, driven by population pressures, and a perceived need to reclaim land from heretics and infidels, the Church, in league with kings and nobles, undertook a series of Crusades. The Crusades reopened trade routes to the east, and provided a conduit for ancient Greek and Hebrew knowledge to be re-incorporated into Western knowledge (Price, 1992; Le Goff, 1988).

Up until the tenth century learning was centered in the all male Benedictine monastaries, generally limited to the copying, commentary, and cataloguing of past authorities, and Biblical exegisis. Secular interest in learning developed as the towns grew and literacy increased. This interest in learning was accomodated by local church schools, and the Cathedral schools in larger centres. The Cathedral schools were primarily, but not at first exclusively, for male students.[10] The University system, based on ancient Hebrew and Greek ideals, developed out of the Cathedral School. One of the first Universities in Europe, the University of Paris, was established by Peter Abelard in the eleventh century. (Le Goff. 1993)

Before examining the re-organization of medical-theological concepts of the male, the female and sexuality, it is necessary to look at the situation of women in institutions of learning. Julia Holloway (1990) in her work on the relationship of women to the written word, divides the Middle Ages into two periods; the Romanesque which was discussed above as the early Christian period, and the Gothic which includes the period of concern in this section. Hebrew and Greek women had, with some exceptions, been kept illiterate. Roman women of the ruling classes had been given access to reading and writing for household management, and personal correspondence. In embracing the ascetic life of Christianity, the chaste woman/virgin acquired literacy in order to study the scriptures, and writings of the early Fathers. Until forbidden by the edicts of the Council of Nicea in 325, these women taught and preached in public either independently, or in the company of men. Augustine was primarily responsible for making the distinction between the sacramentum, the male study of the word of God, and the propheta, the female speaking of God through visions. This was the beginning of the 'female apartheid' from education in the Christianized

European context (Holloway, 1990). Priests, monks and clerics required literacy, consecrated virgins blessed with access to God through passive meditation, did not. Holloway (1990) claims that this created a shift in women's self perception from the forthright intellectual persona of a Catherine, or Hypatia, to an internalized negation of female power in 'not knowing'. Without access to the written word, the ascetic women's knowledge returned to an oral tradition. When the Universities were established in the eleventh century, they adopted the ancient Greek and Hebrew methods of collective learning that refused entry to women because reason was a masculine characteristic. Medicine, like theology, philosphy, and the new discipline of jurisprudence, moved into a knowledge production system where women's ideas, and experince were absent (Le Goff, 1993). The re-constitution of sex difference therefore occured almost exclusively within a masculine discourse.

The focus of the debates on sex difference during the period 1100 to 1400, was on female anatomy, and the two seed/one seed theories. The two seed theory, and its variants, has a long history in Indo European thought. It appears in Vedic literature which influenced the Hippocratics, and the later Galenic synthesis. Aristotle was the exception. Galen's treatises on medicine, and Augustines moral-sexual writings guided medical-theological thinking of the male, female and sexuality until Latin translations of Arabic texts re-introduced Aristotle's *On the Generation of Animals*, and *The History of Animals*, into Western centers of learning (Jacquart & Thomasset, 1988)

The first translations of Arabic/Greek texts were undertaken at the end of the eleventh century by Constantine the African. His work, *Pantegni*, became one of the principle texts for later commentary (Jacquart & Thomasset, 1988). The Latin vocabulary was not always adequate; Arabic words and phrases often did not translate well. This had serious consequences for the representation of anatomical knowledge, particularly female specificty. For example, a tenth century Arabic text, *Al-Kunnas al Maliki*, described the female genitalia distinguishing the anatomical position and function of the labia, from the clitoris. Constantine did not have a Latin word to name either the labia or the clitoris, so he used the word 'badedera' (flaps of skin) which corresponded with the already established homology of labia/clitoris with the penile foreskin (Jacquart & Thomasset, 1988). Since neither of these 'parts' were perceived to have a role in procreation, and the pervailing perception was that female anatomy was an inferior but exact copy of the male, there was no real need to name the 'womanly parts'[11] accurately, and certainly no reason to suggest a source for an autonomous female sexuality.

At the end of the twelveth century, Gerard of Cremona, and the Toledans translated Avicenna's *Canon of Medicine*. The 'Canon' re- introduced Western physicians to Galen's summa on anatomy, *De Usa Partium*, in which he forcefully put forward Aristotle's idea of the inverse nature of male and female generative organs which described female anatomy in reference to the male model. This shifted the discussion of sex difference from the sexuality-power/weakness moral framework of Augustine, back to the essential physical nature of the male and female body. Avicenna's 'Canon' also restated Aristotle's denial of female sperm/seed. Medical-theological discussion of sex difference divided into two camps (Jacquart & Thomasset, 1988).

The Hippocratic-Galenic consensus was that female sperm/seed was thin and cold, and acted only to moderate the heat of thicker male sperm by spreading it around the uterus so that the two seeds could mingle evenly and activate the blood-matter to create new life. Female sperm/seed was necessary but secondary to male sperm/seed. The precondition for production of male or female seed was pleasure within the moderation required by Christian marriage. The Aristotelian position, as constituted in the Arabic texts of Avicenna (Canon of Medicine), and Averroes (Colligit), did not completely deny the presence of female sperm/seed. It was reduced to a watery passive liquid that aided intercourse, but contributed neither form, nor matter, to the fetus. The female only derived pleasure from the emission of male seed; her pleasure did not arise within her own body, nor was it necessary for conception. As Jacquart and Thomasset (1988) suggest, in a medical-theological world view preoccupied with the anatomy and physiology of reproduction and its role within divine creation, there is tremendous significance in denying women any possible role in this process.

By 'disappearing[12] the clitoris through lack of accurate representation, emphasizing the inverted/incomplete nature of female anatomy, making female pleasure dependent on male emission, and denying the female an active seed, the Aristotleian school of thought reduced the female to an absolute antithesis of the male. This did not correspond well with the theological position that man was created as male and female for a necessarily complementary role in procreation. When Aristotleian texts, and methodology were completely adopted by the Universities around 1250 (Allen, 1985), it was evident that some form of compromise was necessary to maintain the conjunction between medical and theological knowledge. This became even more important by the end of the thirteenth century when the ban on post-mortem dissection was lifted and empirical observation of human anatomy began to replace philosophical conjecture based on animals.

The compromise was constructed within a theological framework by Albert Magnus (1193-1280), and his pupil, Thomas Aquinas (1224 - 1274). Within the Universities, with the adoption of Aristotlian logic, the methodology for knowledge production changed to the scholastic system. This system of knowledge production consisted of posing questions to textual authorities, and responding to those questions through rhetoric, a logical series of syllogisms that claimed to establish the truth, or falsity, of the total text. Albert Magnus went beyond this scholastic formalism to arrive at a new synthesis of knowledge about the male, female and sexuality through direct textual commentary, and the experience of women as he heard it during confessions. As summarized in Jacquart and Thomassett (1988), and Cadden (1995), the compromising synthesis consisted of the following. The female body was more open and porous than the male body, and therefore colder. Her cold nature prevented full concoction of the humours into pure seed. Menstrual blood in a purified state, provided the passive matter to be acted upon by male seed. Unpurified menstrual blood was dangerous because it was an expulsion of residues that could cause disease (among other things). Female seed was a material substance that when emitted during the sex act excited a woman's desire to receive male seed. Involuntary emmission of female seed (vaginal discharge), occurring night or day was a defilement, a sign of impure thought or unnatural sex acts. During confession women told Albert Magnus that they conceived without orgasm, therefore he concluded that female pleasure was not necessary. The anatomical, and physiological female remained an imperfect male. Aquinas was more inclined to use Aristotle to propose a concept of human nature as an essence that was a union of body and soul within divine creation (macrocosm), that differentiated male from female based on the 'imago dei'. At the individual level (microcosm), the female was, as his mentor Albert Magnus had stated, the imperfect kind of 'man' that lacked the active principle of power in that most vital of all human activities, procreation. The adult female was merely passive fertility, a frail version of the male (Mahowald, 1983). Aquinas also adopted Augustinian thought on the soul and reason. There was a unity of souls in god, but reason (mind) was still divided into masculine intellect and feminine intuition (Lloyd, 1984). The 'one sex' model of sex difference, within the conceptual framework that structured this compromise, is illustrated in Appendix A. Figure1.

In this period of increased literacy, and social change, women did have more opportunities to write about the issue of sex difference. For the most part, the texts that have survived do not contradict medical-theological opinion. Hildegard adopted and expanded the Aristotlelian position within her writing as a mystic visionary, Heloise opposed marriage but did not write about the the concept of the female, and Trotula, the midwife, combined the theory of the humours with a more woman centred Arsitotelian position (Allen, 1985). Women's opposition to male opinion on the female, was possibly a feature within the heretical sects, both gnostic (Cathar), and evangelical/apostolic (Waldenesian, Free Spirit, Beguine), but these beliefs were often not written down (Lambert, 1992). Their story is told largely by the Churchmen who opposed them. By reading against the grain, searching out sources of pagan mythology and rituals, and filling the silences, and ommissions, we are coming to know that as Morris Berman (1989) states there is a hidden history of body and spirit within the Western tradition. It is beyond the scope of this paper to trace that history.

By the beginning of the fourteenth century, philosophical debates about the nature of the male and the female bodies subsided as human dissection provided more empirical evidence, and medicine, as a University based discipline, separated from theology. The debates around the two seed/one seed theories, and male-female sexuality would continue for centuries. However, the foundation for sex difference had now shifted from sexuality, to aspects of reproductive anatomy where the 'natural' was defined by both a male, and a procreative standard. In the nearly 2000 years from the Hippocratics to Thomas Aquinas, the concept of sex difference had essentially gone in a full circle, from anatomy to sexuality and back to anatomy, always priveleging the male body. During this same period of time concepts of masculinity and femininity, and the structured separation of humans based on those concepts, varied according to socio-economic and political specifics, but essentially remained constant. Masculinity was priveleged over femininity. The two hierarchies, male over female, masculinity over femininity, were not yet a coherent system. The one sex model (Laqueur, 1990) allowed slippage of characteristics and behaviors across bodies. The conditions of possibility for such a coherence would not be available for another four centuries.

As the science of 'sex' developed over the next 400 years, there would be concrete 'discoveries', new classification systems, and several conceptual reorganizations as divine inspiration gave way to the humanist project of science. A continued teleological framework, and the idea that man was created as male and female, would keep discussions of sex difference largely within a one sex model until the eighteenth century (Laqueur, 1990). The ancient beginnings for concepts of masculine and feminine, divisions of labor and spheres of activity and bodily sex difference, brought together into a synthesis by the thirteenth century Churchmen, still echo through contemporary discourses on gender, sex and sexuality. In the following chapter I will trace the construction of sex difference, and reorganizations of the concepts of masculine and feminine, as conceptual frameworks were organized to reflect a man-centred universe.

NOTES

1. Rationalism was not hegemonic during this period, nor did conceptions of the body originate with the Greeks. Counter arguments to 'reason' were contained within myth based cults, Orphic philosophy, and Sappho's poetic valorization of desire over reason as the basis of wisdom. Gynaecology, Astronomy, and Chemistry were all established 'sciences' in Egypt, Babylon, and Alexandria by 1000 BCE. See for example Alic, 1990; Allen, 1985]

2. Aristotle attributed the Table of Opposites to the Pythogoreans as follows: limit/limitless; one/many; male/female; odd/even; right/left; rest/motion; light/dark; good/bad; straight/curved; square/oblong. Terms in the right hand column are the superior terms. See Allen, 1985:19.

3. The fluids associated with the humours were: earth/cold-dry/black bile; water/cold-moist/phlegm; air/moist-dry/blood; fire/dry-hot/yellow bile. See Jacquart and Thomasset, 1988:49.

4. The ovaries were referred to as testes muliebres/female testes, until Fallopio renamed them in the 16th century. Jacquart & Thomasset, 1988.

5. It was generally assumed that same sex acts between women involved either an instrument, or some disfigurement of the female genitalia that allowed penetration. See Laqueur, 1990; Traub, 1995.

6. There are two versions of the creation myth concurrent in the first two chapters of Genesis. The first to occur is Genesis 1:27 where God created male and female at the same time with no reference to any relationship between them. In Genesis 2:15-22, the Lord God created man/Adam, and then from Adam, he created woman/Eve with a specific reference to their relationship as 'man and wife'. This continues in chapter 3, as the story of man's Fall, and eviction from Paradise due to the acquisition of knowledge of the body and sexuality. The two stories originate from different sources; God as reference to the Caananite Baal in a belief system that had a male and female principle in creation, and Lord God as reference to the Hebrew deity as an exclusively male principle in creation. The second version was adopted by the orthodox

Christian Church. See Bible; Cloke, 1995; Pagels, 1988.

7. In both Greek and Latin, the word virtue derived from vir=man/masculine. See Cloke, 1995:213.

8. Peter Brown in The Body and Society: Men, Women and Sexual Renunciation in Early Christianity (1988, Columbia University Press) makes the same points about Augustine's work but shies away from Augustine's clear association of lust with male sexuality. I am therefore locating this discussion in Joyce Salisbury's more recent, and more feminist oriented, Church Fathers, Independent Virgins, 1991, Verso.

9. The benedictine monastic system for men, with its rule of poverty, chastity and obedience was not established until the sixth century. See Price, 1992.

10. For example Heloise was educated at Notre Dame Cathedral School. See Holloway, 1990.

11. See Thomas Laqueur, 1989, for a full history of the names given to the labia/clitoris from antiquity to the Renaissance. Some of the names, do suggest the function! Also, this translation error would have consequences for women during the witch trial era. Because the clitoris was not represented as a 'natural' feature of female anatomy, when women were examined for evidence of witchcraft, the 'unknown' clitoris became the 'devil's teat', evidence of diabolical activity. See Jacquart & Thomasset, 1988.

12. The real disappearance of the clitoris also resulted from Arabic medical texts that compared the clitoris to the penis in a metonymic relationship, and recommended clitoridectomy to divert female passion from external genitalia to a vaginal reception of male seed. See Jacquart and Thomasset, 1988.

Chapter III. One Sex/Two Sex: Creating Difference

As I illustrated in the last chapter, a particular world view, or conceptual framework, tends to limit the way in which something can be known. The up-down, sky-earth view of the universe in the Hebrew, Greco-Roman, and Christian mythology structured a vertical hierarchy. Ancient and Medieval concepts of feminine and masculine, and knowledge of the body as male, female or hermaphroditic kinds, were aligned with this cosmic world view (Daston & Park, 1995). The masculine/male as the superior kind, resulted from a male centered mythology and system of knowledge production that was embedded in androcentric sociopolitical-religious power networks. We can only guess at the origins of this knowledge-power-knowledge system, but the end result was a constant shifting of masculinity and maleness toward the superior pole. Within cosmic-divine conceptual frameworks the criteria used to determine the difference between the concepts of feminine and masculine, and the differences between male and female bodies, varied according to the knowledge system, or methodology, of the author of the theory. In an age when the written word meant laboriously hand copied manuscripts, there were relatively few texts that could act as authority for discussions of masculine and feminine principles, the body and sexuality. The Churchmen's hegemony over the written word, also meant that opposing ideas could easily be suppressed, or simply argued out of existence. This hegemony was disrupted with the invention of moveable type, and the printing press in the fifteenth century (Eisentstein, 1993).

In this chapter, the major focus will be on the period 1600 to 1850. In the first section of the chapter, I will discuss the changes that occurred in conceptual frameworks during what we refer to as the Scientific Revolution. The second section of the chapter will take up Thomas Laqueur's (1989, 1990) theory of the persistence of the one sex model (i.e.: 'man' created as male, female and hermaphrodite), and briefly examine this theory in light of what was 'discovered' about the male and female body during the period prior to 1800. These two sections will provide the background for a discussion of conceptual reorganizations in methodology that made it possible for masculine and feminine, and differences between the male and the female, to become objects of scientific study.

The More Things Change ....

Aristotelian scholastic methodology, and the imperatives of Christian theology, dominated the production of knowledge in the monastic based Universities at Paris, Padua, Bolgna, and Oxford until the early decades of the fourteenth century (Noble, 1992). The emergence of a new way of knowing had several 'causes' arising out of neo-Platonic humanism, the incommensurability of new 'fact' with old theory, the mathematization of probability, changes in socio-economic conditions, and the political development of Monarchy led nation states. During the last half of the thirteenth century, Albert Magnus broke away from the formalism of the scholastic method by partially structuring his views on the nature of male and female in the more empirical method of listening to experience. The Hippocratic-Galenic medical system, also based on empiricism rather than the idealism of language and texts, was a more sensible lens through which the post-mortem anatomical body could be 'discovered' and theorized. While methods of observation for knowledge production were being refined at the Universities in Europe, the methodological emphasis at Oxford was on mathematics, and mechanical physics(Noble 1992). By the late thirteenth century, the new discipline of natural philosophy combined observation techniques with mathematics to produce mechanical explanations for natural phenomena. In 1277 the Churchmen, in an effort to maintain control over knowledge within a theological framework, condemned Aristotelian based natural philosophy while retaining the Aristotelian scholastic method. The development of 'science' from that point onward was increasingly a secular enterprise, largely rejecting the absolute certainty of a god-created universe (Daston, 1988; Noble, 1992).

The Reformation, a revival of a moderate form of gnosticism that succeeded in Protestant sects where it had failed in former radical heresies, led to a further separation in knowledge production (Lambert, 1992). Disciplines within Catholic Church affiliated Universities retained the world view of organic harmony, viewing man and nature as complementary. The Academies,[1] established in the seventeenth century were affiliated with the Courts and noble patronage. Members of the Academies embraced a secular humanist framework, that separated man from nature based on the Biblical command that man have dominion over the natural world (Merchant, 1983, Noble, 1992).

Nature was identified with ancient concepts of the feminine, and the materiality of the female body constructed through myth and Medieval theological-moral theories of anatomy and physiology. This led to two conflicting notions of 'nature'. The first idea was that nature was represented by the passive nurturing female body that complemented the active force represented by the male body. Conversely, the second idea posited that nature was represented by a feminine sexuality that could destroy 'man', and lead the universe back to chaos if nature was not controlled by masculine reason (Merchant, 1983). The tension between the two representations of nature-as-female/feminine was resolved by the enormous changes occurring in the realm of human activity that influenced the foundational concepts used to structure a world view of nature.

Although the intent of this Thesis is to bracket socio-economic and political conditions in order to foreground conceptual frameworks, we need to examine briefly one influential series of events that began in the twelfth and thirteenth centuries on the Italian peninsula with the development of international trade. The early European town-market system was based on the barter of goods that had roughly equal use value. Mercantilism, an early form of capitalism, emerged as imported and local craft-guild manufactured goods were given an exchange value based in the cost to produce goods and the profit necessary for reinvestment in the continued production of those goods. This new type of economy required raw materials extracted from nature. As Merchant (1993) demonstrates this use of nature to produce beyond subsistence, accorded best with the idea that 'man' have dominion over the natural world. Commercial interests encouraged technological invention, which led to the exploitation of nature for the raw materials demanded by the technologies. As this spiral accelerated, the view of nature changed from a source of passive order to a source of potential unyielding irrationality (Hacking, 1990) Within the female-as-nature-as-chaos framework, the feminine and the female body represented the irrational (Merchant, 1983). In a humanistic man-centered universe, the certainty of divine inspiration that posited man in nature, was challenged by the skepticism of the autonomous knowing being who stood outside of nature. To know nature in order to have it yield resources, man, as a reasonable creature, had to discover the processes governing nature. The commercially driven world view of nature, was complemented, by the revival of ancient alchemy and the hermetic arts in the Academies (Merchant, 1983). Alchemy[2] had a strong gnostic focus that rejected the body and sensuality. The magic involved in Alchemical processes was primarily an attempt to appropriate the power of creation in order to release the feminine from an hermaphroditic nature, and bring it under the control of masculine reason. (Roberts, 1994; Noble 1992)

In the realm of human affairs two other events influenced the structure of the perception of nature. In the last chapter, I discussed the relationship of women to the written word. In 1464 Gutenburg produced the first Bible printed with moveable type (Eisenstein, 1993). The invention of the printing press[3] secularized what had been the monastic production of 'books' by hand copying. As printing became a commercial venture, it forced an increase in literacy at all social levels, in order to have a market for its products. The product itself, moved from the religious base of 'books' produced largely for inspiration, and education in ancient authority, to poetry, novels, advice books, popular medicine, and political tracts. Women, who with some exceptions, had been cut off from the written word, increasingly had access to these new books, monographs and pamphlets, as both readers and writers. The continued exclusion of women from the Universities and Academies,[4] and the gradual separation of academic men from the woman-hosted salons where the new ideas of science were initially debated (Harth, 1992) meant that education for most women, beyond simple literacy and numeracy, was largely limited to personal endeavor, or private tutelage. By the eighteenth century women were no longer a visible part of the development of science (Schiebinger, 1989; 1993). Once again, even as the prevailing epistemologies began to change, knowledge about the body and the construction of the concepts of the male and female, occurred within a male-centered milieu.

The second event, or series of events, that affected the construction of concepts of male, female, and sexuality from 1400 to 1800 had its roots in the Medieval Churchmen's preoccupation's with 'pagan' belief systems,[5] sexual perversions, heresies, the female role in procreation, and the nature of evil in diabolical magic. The Papal Inquisition's original focus was on the infidel Muslim, the recalcitrant Jew, and the apostolic/gnostic heresies. By the fifteenth century the Inquisition had turned its attention to the women who continued to practice the rituals of pagan belief systems, and mystery and fertility cults. They, along with local wisewomen healers and midwives, were suspected of being in league with the devil (Russell, 1972). This, of course was the outward reflection of the concept of the female that Churchmen had constructed as inferior and tainted. In 1484, two Dominican priests published the Malleus Maleficarum (cf. Summers, 1971), a document that brought together all of the current knowledge of the female, cults, and heresies, to create the social-sex category, the 'witch'. The end result was 400 years of persecution that literally burned out a vast oral tradition of woman-centered knowledge of gynecology, contraception, sexuality, and spirituality (Barstow, 1994). With most of the sources of this folk knowledge repressed, and other sources of participation in knowledge closed to women, women at all social levels had little choice but to rely on knowledge about their bodies as it was written by men. This situation would prevail until the late nineteenth century.

David Noble (1992) draws a parallel between the monastic based Universities, and the Academies of Science. Both were male homosocial societies with gnostic tendencies. In practical terms this meant that those who had the power to legitimate the truth claims of science stressed an androgynous, asexual ideal while retaining either moral-theological or alchemical ideas about the taint of the feminine, and the inferiority of the female. As ancient Pythagorean, Platonic, and Aristotelian ideas of the spirit/soul became institutionalized in the scientific enterprise, masculine reason structured the universe and the natural, and social world as mechanistic systems governed by mathematical laws. Science, as it developed during the seventeenth century masculinized nature, thus incorporating a domination ethos into studies of the natural world. This had lasting effects on concepts of masculine and feminine, and on the sexing and sexualizing of bodies. I will briefly outline the conceptual changes that occurred during the seventeenth century, and then elaborate specific points as the Thesis proceeds.

In the early decades of the seventeenth century Francis Bacon published *Novum Organum* in which he proposed that theories of the natural world be drawn deductively from hypotheses tested by observation and experiment (Wertheim, 1995). This proposal was followed by: Galileo's presentation of evidence for a heliocentric universe within which the earth moved as a planet (Wertheim, 1995); Pascal's theory of probability showing that chance could be assessed mathematically (Daston, 1988); Descartes' *Le Discours de la Methode* that founded modern philosophy on mathematical logic, established a total dualism between mind and body, and described nature in terms of clockwork systems manufactured by god, and operated by man (Harth, 1992); Hobbes suggestion that a universe consisting of material atomistic particles moving in a void held together by invisible forces, bore a similarity to atomized individuals in human groups held together by an invisible contract (Pateman, 1988). During the last half of the century, calculus was developed independently by Leibniz and Newton. In 1687 Newton published the *Principia*, providing evidence that forces of gravity held the elements of the universe in stable equilibrium and governed the motion of all matter (Wertheim, 1995). Before turning to the anatomical, physiological, and natural science 'discoveries' that provided a foundation for concepts of male and female in the period 1400 - 1800, it is useful to summarize the conceptual context for these 'discoveries'. The institutions of knowledge production were exclusively male. The epistemologies used by the men within these institutions, both inductive and deductive, were embedded in the notion that nature as female, or as the feminine aspect of a hermaphroditic universal principle, was subject to the domination of masculine reason. The human body was becoming synonymous with a machine[6] as the organic world view of the whole, gave way to a mechanistic world view of differentiated parts. With the development of printing, the truth claims of science were increasingly open to 'popular' scrutiny and debate. Under the perceived threat of the devil-as-woman, the Churchmen, both Catholic and Protestant, destroyed a level of knowledge of the female body grounded in women's experience of their own bodies. And finally the reconceptualization of the universe as heliocentric and governed by mathematical laws changed the framework[7] for cosmic-human harmony.

The Persistence of the One Sex Model

In Appendix A. Figure 1. I have presented a conceptual model to demonstrate graphically the idea that 'man' was created as male, female and hermaphrodite. This model is only sensible as long as 'man' is constructed as a creature with a special relationship to the god/cosmos, and the kinds of 'man' are constructed as inferior, intermediate or superior. At the microcosmic level of human activity, social sex categories like woman, man, hero, virgin, or witch adhered to the superior or inferior kind according to whatever criteria was being used to differentiate masculine and feminine characteristics and behaviours. This one sex model was not derived from any particular text, rather it was designed as an heuristic devise to demonstrate a general conceptual framework, or paradigm.

Thomas Laqueur (1990) makes the claim that up until the eighteenth century, the dominant conceptual model remained a one 'sex' model. He states that, "Sometime in the eighteenth century, sex as we know it was invented. The reproductive organs went from being the paradigmatic sites for displaying hierarchy, resonant throughout the cosmos, to being the foundation of incommensurable difference" (1990:149). In other words, a two sex model was constructed that posited that the male and female were altogether different creatures. Foucault (1970) situates this change in the seventeenth century, and Schiebinger(1989) at the end of the eighteenth century. In the next chapter, I will present evidence that a two sex model, as a clear differentiatian into 'opposite sexes', would not be totally intelligible until the end of the nineteenth century. The anatomical and physiological 'discoveries', That occurred within the context described in the first section of this chapter, need to be examined briefly. This will situate the body, and the criteria for difference between the male and female, in the framework of natural science as it was prior to the major conceptual changes of the nineteenth century.

In spite of the observed evidence from post mortem dissection, there was initially tremendous resistance to any revision of anatomical knowledge (Laqueur, 1990:70). The influential sixteenth century anatomomist Vesalius[8] continued to promote the idea of the interchangability of male and female reproductive organs (Shildrick & Price, 1994). In 1559, Realdo Columbo[9] discovered the clitoris, describing it as, "the seat of women's delight" that requires "attention", or a woman would never conceive, for it "governs the expulsion of female seed" (in Traub, 1995:84). Columbo represented the clitoris as homologous with the male penis, even though anatomical evidence could not support that claim. Laqueur (1989) states that this penis/clitoris homology persisted for another 200 years because it reduced the threat of a female eroticism by collapsing all female genitalia into reproduction where the female was perceived as the passive vessel.

Laqueur's (1990, 1989) tendency to fix his one sex theory in the valorization of the anatomical male-as-model, closes off the possibility that anatomy was not the whole story of the significance of the 'discovery' of the clitoris for the concept of the female (Traub, 1995). To see beyond the map of the body we need to link anatomy with physiology, and with a broader notion of the sexual. The anatomical hermaphrodite came under intense scrutiny during the sixteenth and seventeenth centuries as evidence of a chaotic nature. Within the Hippocratic tradition, the hermaphrodite was a kind of 'man', exactly in between the male and the female, an intermediate 'sex'. The Aristotelian position was that the hermaphrodite was not a 'sex', but rather "beings with doubled, or redundant genitalia" (Traub, 1995:421). Albert Magnus, in his thirteenth century attempt to synthesize these two perspectives, compared the hermaphrodite to the manlywoman (virago), and the effeminate man, as "liars whose bodies and behavior mislead" (in Cadden, 1993:212). A revival of the more Hippocratic centered perspective during the sixteenth century, located the hermaphrodite on a spectrum of intermediary of sexual types between the virago and the effeminate man. This location associated the hermaphrodite metaphorically with the sodomite, because of the suspected tendency of the virago toward tribadism, and the effeminate man toward sodomy. The hermaphrodite also became associated with the cross-dressing transvestite.[10] The hermaphrodite came to represent a natural sexual ambiguity that provided a laboratory for determining the relation of the male and female to nature, as well as a cultural metaphor for unnatural sexuality (Traub, 1995). Both of these representations were connected to first, a growing anxiety[11] about boundaries between masculine and feminine characteristics and behaviors in both divisions of labor and separate spheres of activity, and second differences between male and female bodies, and between procreative and non-procreative sexualities.

Sexuality remained a contested discourse constituted through the physiology of reproduction, and the theological-moral emphasis on procreative versus perverted sex acts. As Traub (1995) demonstrates, the 'discovery' of the clitoris, and its homology to the penis, gradually incorporated the notion of female desire back into male-female intercourse. But more importantly for the concept of the female, it re-awakened interest in tribadism through the additional 'discovery', that just like the penis, not all clitorises were the same size.[12] If the clitoris functioned like the penis, it was entirely possible that certain females could usurp the male prerogative, and penetrate another female without the aid of an instrument (dildo). This idea was reinforced by the travel literature connected with colonialism, that described 'foreign' women's reproductive organs, and sexual activities. By 1671, Jane Sharp, writer of the first English midwive's book, was warning physicians about the unnatural size of the clitoris leading to unnatural acts among African, and Muslim women, that if known to English women, could cause them to imitate (Traub, 1995; Laqueur, 1989). This illustrates what would become a trend in male centered medicine. An anatomical feature of the female body could, through representation, be changed to an organ that had a function not only outside of reproduction, but also potentially outside of natural femaleness. Thus female-female sex acts were associated with a 'person' through body parts, whereas male-male sex acts remained associated with a 'person' through behavior (Traub, 1995;

Creed, 1995). Female perversions were in this way, kept attached to their bodies; specifically their 'womanly parts'.

In spite of an anatomical view that tended to revive the two seed theory, woman's physiological role in reproduction was obscured by the insistence on her passivity The male perceived as the active creator of living beings, complemented the view that masculine reason was the creative force in the development of knowledge. The idea of a dominant male role in procreation was challenged in 1672 when de Graf 'discovered' the ovarian follicle which confirmed William Harvey's 1651 claim that all life originated in an egg (Schiebinger, 1989). For awhile it appeared that the liquid male sperm might have a secondary role in conception. However, male dominion over this process was reasserted in 1694 when Leuwenhoek and Hartsoeker described the presence of animalcule in male sperm. Each 'seed' was a fully formed homunculus (little person) who was activated in conjunction with the female egg that simply provided a 'nest' of nourishment (Schiebinger, 1989). The one seed/two seed debate was put to rest for awhile, converted to an active sperm versus active/passive 'egg' debate.

As long as the body, as a whole entity of mind and flesh, was central to uncovering the secrets of human nature, the focus was on resemblances located in the generative organs. As the methodologies of 'science' developed, with their emphasis on reason, attention shifted from reproductive organs to the brain. Initially the humours theory guided notions of male and female differences in the brain. The cold moistness of the female prevented full development of the brain, and this along with inherent female irrationality, explained why women's minds did not function as well as men's (Shildrick & Price, 1994). The male-over-female standard within an organic sameness as 'man' was gradually giving way to a recognition that differences in female 'parts' might mean that the female was other-than-male. Within the conceptual framework of body as machine, the size of the brain, and the way that it functioned as a source of intelligence, began to contribute to ideas of difference between male and female.[13] In anatomical terms, a bigger brain meant a higher level of intelligence. Therefore those with a larger skull were by nature more endowed with a larger capacity for reason. Representational drawings of the male and female skeleton began to show the female with a small skull; a skull often totally out of proportion to the rest of her skeleton. (Schiebinger, 1989)

Differentiation of 'man' into the male and the female as distinct creatures rather than gradations on an inferior to superior scale, was not as sudden as Laqueur's (1990) one sex theory tends to imply. The anomalies that I have discussed were, in a Kuhnian (1970) sense, pushing the older paradigms aside throughout the period 1400 - 1700. The radical shift toward toward two sexes as we know them, began in earnest with the Enlightenment. The seventeenth and eighteenth century preoccupation with reason led to a conceptual split of the mind from the body by shifting the locus of personhood (subjectivity) for the male at least, to the mind (Shildrick & Price, 1994; Bordo, 1994). As the body became devalued as a source of knowledge about, and victory over, nature it was no longer necessary to entirely focus difference between the male and female in the inferiority or perfection of reproductive organs, and processes. The perception was that parts of the body were driven by the force of the mind in the same way that water drove the parts of the new machines (Schiebinger, 1989). If the female had less mind than the male, by virtue of a smaller brain and an inherently irrational nature, then it followed, through the analogy to machines, that her body was also weaker than the male body. The Hippocratic notion of heat making the male body stronger, was replaced by the notion of mind making the male body stronger. The relative value and strength of natural male and female bodies was carried over into concepts of masculine and feminine and the structuring of divisions of labor and separate spheres.

Rousseau's treatise on education[14], *Emile*, is a good example of the beginning of a trend toward transference of constructions of the male and female body, into the concepts of masculine and feminine. Emile may be the proto-type for modern representations of the concept of gender because with Rousseau we see the establishment of a direct link between body type and behavior presented as a social prescription (Zerilli, 1994). More importantly Rousseau introduced the idea that human behaviors that would serve the collective, might be contrary to the nature of any individual male or female. Therefore the child had to be socialized into useful characteristics and roles. The natural body (chaos) had to be tamed in order for it to become social (order). The process of socialization required a series of standards for characteristics and behaviors that could be assigned by body type, so that children could be educated to fulfill roles that would maintain an orderly society (Schiebinger, 1989:221). Emile was a recipe for this process at the level of education. The development of standards for masculinity and femininity would begin to emerge in the nineteenth century with the application of the methodologies of probability, and the development of a concept of average, or normal.

Creating the Average Man

The nineteenth century female body was as avidly explored for her secrets, as she had been in the previous four centuries. Anatomists and physiologists now concentrated on the depth of difference in male and female bodies. In 1827 Karl Ernst von Baer demonstrated the process of the release of the ovum from the ovarian follicle, and its movement down the fallopian tube. He situated this process within the still commonly held belief that intercourse, if not the presence of male sperm, stimulated ovulation. By 1843 the process of ovulation in relation to estrus without coitus had been demonstrated in female dogs; a similar process in relation to menstruation was suspected in the human female. Actual evidence for the spontaneous release of the ovum, and its link to the menstrual cycle would not appear until the 1930's. (Laqueur, 1987). By the mid-nineteenth century, the ovary came to be regarded as the definition of what it was to be a woman, "the essence of femininity itself" (Laqueur, 1987:27). Menstruation was now represented as the time that women were 'in heat', and like animals capable of an explosion of sexual desire.

Rather than see this as a suggestion of an autonomous female sexuality, medical science took two positions. The ovarian/menstrual process was either further evidence of irrationality, or because it was a process that was outside of women's physical control, evidence that the female mind was preoccupied with internal processes, therefore incapable of reasoned intellect (Laqueur, 1987). Medical and natural science, dominated by men, moved the locus of female desire from the clitoris to the ovary; from the outer body (public), to the inner body (private), from pleasure to reproduction. As the male ethos of bourgeois capitalism created the 'angel in the house' metaphor, the scientists created the 'cult of motherhood', based on a tiny internal organ, and a process that could only be guessed at by post mortem observations through a microscope.

This brief look at a further 'discovery' in the female body illustrates the beginning of an anatomical essentialism used to define human characteristics. The idea of essences was certainly not new, and mechanistic science had long established the hierarchy of parts over the whole. The concept of an essence (a part) being a factor that determined abstract personhood at a collective level, was emerging out of the gradual incorporation of mathematical laws into the study of living beings. In order to have a 'part', physical, mental or behavioral, become a defining characteristic of abstract persons, natural science had to have a way of establishing categories of persons with that 'part' in common, and a legitimate way of expressing what was common, and what was not. Statistics, and the theory of probability, would provide the necessary methodology and method.

The methodology for categorizing humans into populations of kinds by commonalties constituted a conceptual re-organization following Thagard's (1992:37) schema where a simple conceptual reorganization involves a distinction, or differentiation, that creates new kinds of things (eg: a population category) but retains the former hierarchical order of conceptual relations between the kind of thing (eg: the human group), and the parts out of which it is made (eg: individual bodies). The conceptual reorganization of probability theory during the nineteenth century provided one of the conditions of possibility necessary for our modern concept of gender. The history of probability is also an important component of the historical constancy of gendering. The remainder of this Chapter will examine probability theory in detail up to the mid-nineteenth century. This history will continue in the next Chapter, connecting probability theory with theories of evolution.

The concept of probability has intellectual roots in Aristotelian logic, Medieval Talmudic exegesis, games of chance and maratime insurance contracts. Mathematical probability based on stable frequencies and combinatory derivatives emerged in the seventeenth century from legal theory and practice (Daston, 1988) in response to the skepticism of the Reformation and Counter-Reformation. Formerly, belief in an omniscient god meant that random "causeless events were unthinkable" (Daston, 1988:10). All existence was determined by god, therefore a belief in chance revealed ignorance, or heresy. The Protestant notion of predestination, along with the resurgence of the sciences of alchemy and astronomy, introduced the idea of degrees of certainty, positioning probability on a continuum from total ignorance to full conviction.

The focus of seventeenth and eighteenth century mathematical probability[15] was on expectations; for example the outcomes of annuities, hierarchy of proofs in legal theory, and the expectation for good sense and good conduct in human affairs. For the purposes of this Thesis, we need to concentrate on the last point because it entails issues of rationality. The prerequisite for probability thinking was a belief in the regularity and repetitive nature of human activity that posited that rational choice in the face of uncertainty would always lead to good sense and good conduct, if the choices were based on the judgments of an elite group of reasonable men. Mathematical probability as expectation became a strategy for both understanding human activity, and describing correct action. If the conduct of reasonable men contradicted the mathematical calculation of expectation, the mathematics were rearranged to reconcile expectation with reality. In this way variability was explained away, and human nature, and human activity achieved a constancy. Mathematical probability of expectation was based in subjective experience, even though that experience was limited to that of an elite group (Daston, 1988).

Reasonableness was defined by notions of equity and prudence, that is justice and avoidance of undesired consequences, in the face of the risk of uncertainty and the physical possibility of any action. Reasonableness was a masculine characteristic based on the location of reason in the masculine psyche/soul. During the seventeenth and eighteenth centuries mathematics was divided into the pure mathematics of cosmological calculations, and mixed-mathematics that included the art of conjecture in quantified possibilities (expectations) for human conduct and social reform. Mathematical probability was therefore connected to the moral sciences of theology and natural philosophy. La Place was to refer to probability as good sense reduced to calculus where nature's habits become laws; experience translated into mathematics (Daston, 1988:220).

In the eighteenth century men sought laws governing society to complement the physical laws that governed matter. In this way harmony could be found in social organization, and social organization could be harmonized with the organization of the cosmic and natural worlds. Hacking (1990) claims that the notion of observed frequencies emerged from a doctrine of natural signs in the reemergence of Alchemy after the twelfth century. This led to the idea of diagnosis as inference from the signs in one overt particular to the hidden properties in another particular. For example overt hysteria in women as a sign of hidden properties of the womb. The calculus of probability quantified the diagnosis of social issues by redefining rationality as the pursuit of personal advantage where the weighing of probabilistic expectation was used to reduce the risk of error in human conduct.[16] Probabilistic expectation could only exist as long as human nature, and human activity were viewed as regular and repetitive based on a standard of reasonableness set according to the conduct of an elite group of prudent men.

The events leading up to, and surrounding the French Revolution put an end to the reasonable man standard as a basis for social theory, by introducing an unpredictability and lack of consensus into human affairs. In effect the mathematical probability of expectation lost both its subject matter and its criteria for validity (Daston, 1988) By the early decades of the nineteenth century mathematical probability based on expectation was replaced with mathematical probability based in measurable distributions and the statistical relationship between error and certainty (McDonald, 1993; Hacking, 1990; Daston, 1988). To examine the impact of this conceptual reorganization we need to slip back in history and look at the connection between the Newtonian universe, and the emergence of the notion of social collectivity in the world of human affairs. Newton proposed that the forces of gravitation held the elements of the universe in a stable equilibrium that was timeless in its predictability, and eloquent in its simplicity (Wertheim, 1995). The atomization of humans as individuals, or elements, in the earthly domain required a similarly simple and eloquent theory for cohesion if cosmic-human harmony was to be re-established within the Newtonian paradigm. The contract theories of Hobbes and Rousseau, combined with the mathematical probability theory of expectation provided a means for a paradigm of stable equilibrium in human affairs. As I will elaborate in Chapter Five, the timelessness inherent in the Newtonian paradigm also provided a means to maintain the concepts of masculinity and femininity, and the structuring of divisions of labor and separate spheres by those concepts, consistent with their ancient roots in mythology and Christian doctrine. The mathematical probability of expectation founded in reasonableness defined by a rational masculine standard, did not disrupt the concepts of masculinity and femininity, change the basis for divisions of labor and separate spheres,[17] or create the conditions of possibility for anatomical sex difference to determine the boundaries between masculine and feminine characteristics and behaviors. The one sex model was beginning to shift toward a two sex model, but this shift had not yet achieved the level of full conviction.

The subject matter (data) of probability changed from good conduct based on the good sense of reasonable men, to the compilation of facts derived from demographic studies. The aim was to apply mathematical probability to this data in order to discover the universal laws underlying all social phenomena. A mathematical, probabilistic understanding of society was no longer based on the observed combined attributes and actions of an elite group. The focus of mathematical probability turned to the aggregated behavior of all members of the social collective catalogued by statistics. The result of this new conceptualization of society, within the perspective of probability theorists, was that it was no longer possible to check calculations against the beliefs and activity of 'real' humans in 'real' situations (Daston, 1988). This became an important distinction when probability was applied to issues of sex difference later in the nineteenth century. Without reference groups, the only frame of reference for calculations was the stereotypes of masculinity, femininity, male, female and sexuality held as true by the theorists doing the calculations.

Eighteenth century rationalists were convinced that natural laws governed the human body; laws that reason alone would discover. These laws would determine what was essential in human nature, and identify what was less-than-human. Empiricists, and the Churchmen, insisted that the free will of individuals could not be so easily dismissed (Hacking, 1990). The idea of causal law determinism (order) had to be reconciled with the notion of individual free will that allowed for chance and variety (chaos). A new style of reasoning was required that in Ian Hacking's (1990) words would "tame chance" by calculating the influence of free will in order to determine its importance in social phenomena.

One solution to this requirement was to categorize people in order to form specific groups and sub groups and then either count instances of behavior through observation, or rely on the aggregated records derived from demographic statistics. Commonalties could then be calculated by comparisons of averages within and between groups. Anything not common within a group was attributed to the free will of some individuals. By the end of the eighteenth century one of the most obvious human categories was 'sex', based on the differences in male and female body parts, and the respective role of body parts in procreation (Laqueur, 1990; Schiebinger, 1993). Another solution arose out of the recognition that the human world did not just consist of individual living beings. Humans were interconnected by their particular culture into larger collectives that could also be viewed as organisms with internal workings to be penetrated, described, categorized, and explained (Hacking, 1990).

Individual bodies, were caught up in the life of this larger social body. The conceptual re-organization of humans into specific categories, and the notion that the behavior of categories of human individuals differed within a social context, provided the logic for the reorganization of mathematical probability after the demise of the reasonable man.

Mathematical probability based on compilations of facts is a deductive process that requires a method of quantification, a way of establishing a true value, and knowledge of variability to asses error. Ian Hacking (1990: 55-62) divides this process into three modes. First, an hypothesis about a regularity must be proposed. For example the ratio of male to female births. Second, the fundamental constants or standards that fix the parameters of the regularity are developed. And finally, boundary conditions are determined to asses uncertainty (chance), and to make inferences. The development of mathematical probability during the nineteenth century, and its application to issues of masculinity, femininity and body sex difference, would ultimately achieve a process that involved all three modes.

The association between probability theory and human social life was proposed by Condorcet[18](1743-1794) as a "vision of mathematically based social science" to be used for population control, and propositions for a social insurance (McDonald, 1993:184) Laplace (1749-1827), and Germaine de Stael (1766-1817) referring to the work of Condorcet, proposed that the examples of the principles of probability from astronomy (curve of error) and games of chance (binomial distribution) be used in social science.[19] In 1796, de Stael, anticipating the debates over determinism vs. free will, proposed that although individuals may be unpredictable, there were regularities in human nature to be discovered in observations of large numbers, or classes, of people (McDonald, 1993). Laplace visualized society as a mechanism and proposed in 1814 that social science be identical to the physical sciences, and concern itself with the laws that determined the operation of the social mechanism (Daston, 1988). In 1835, Simeon-Denis Poisson, reflecting the conclusions drawn by de Stael, suggested that the law of large numbers, that is frequencies of a particular behavior derived from large populations of cases where that behavior was measured, would obscure individual differences and reveal universal regularities in social phenomena. In the early nineteenth century Auguste Comte (1798 1857) proposed a positive moral science of society founded on regularities in human characteristics and behaviors governed by causal laws.

However, he abhorred the idea that statistics and mathematical probability be used for this purpose. He named his science 'sociology' in the hope that it would not be associated with the Laplace/Poisson 'social science' (Hacking, 1990, Daston, 1988).

Within the physical sciences, particularly astronomy, conceptual change in mathematical probability was taking a different path. The focus was on assessment of error in the calculation of the position and motion of the elements of the universe. Repeated measures of the position of a single star or planet were graphed in order to calculate position and a probable trajectory. In 1811 Karl Gauss discovered that the graphed scores formed a bell shaped curve with the majority of the measures at the peak of the curve. This majority of measures coincided with the average of all the scores and was taken as the true measure. Errors in the repeated measures were distributed around that true value. The shape of the curve determined the accuracy of the measures (Gordon, 1991) The point to note in this development is that the Gaussian curve was based on repeated measures of one entity.

By the end of the first three decades of the nineteenth century, two concepts were fully developed, that societies were regulated by underlying causes, and that it was necessary to categorize people within human populations in order to discover the specific causal laws determining specific social phenomena. The major development in the conceptual reorganization of mathematical probability occurred in the work of Adolphe Quetelet (1796-1874). Quetelet studied astronomy at the Ecole Polytechnique in Paris during the 1820's. He was impressed by Saint-Simon's notion that the study of the social world could be scientific, and was familiar with the theories of Laplace and Poisson that proposed a similarity between physical and social science (McDonald, 1993; Gordon, 1991). In 1835 Quetelet published the first book on the statistical analysis of social and biological phenomena. His topics were human anatomical characteristics, intellectual capacity, moral traits, and crime. Quetelet[20] was the first to use categories like age, sex, and occupation in conjunction with demographic data like births, deaths and criminal activity. By grouping humans into specific categories by essential differences such as male/female, Quetelet began the process of 'making up people' (Hacking, 1995, 1986) that would contribute later in the century to the linking of social characteristics and behaviors (masculine and feminine) to body parts (male and female), thereby providing a foundation for the creation of subjective group identities. Using sex as a category of measurement shifted the concept of male and female as kinds of 'man', toward two sub-populations of man; men and women. As we saw in the discovery of the ovary, and its designation as the essence of femininity, anatomical and physiological (natural) essences now defined the social category man, or woman. Concepts of masculine and feminine were becoming fused with concepts of male and female.

The significance of Quetelet's method for the reorganization of mathematical probability lies in the appropriation of the method of calculating error in astronomy and applying it to human and social phenomena. Quetelet took existing frequencies of anatomical features like height or skull size measured in several large populations, determined the categories to be used to divide the population into a subgroups, and then graphed the frequencies of a feature like skull size. The distribution of scores for each category within the populations fell into a Gaussian curve with a true value (the mean), and dispersions around that value in what he termed a normal distribution. He interpreted that bell shaped curve as exactly the same as the curve of error in astronomy. Thus the true value in a distribution of skull sizes in a large number of males in several populations, became the same thing as a distribution of a number of measurements of the skull of one man. (Gordon, 1991). Quetelet made the assumption that repeated measures of one entity were the same as a large number of measures of one anatomical feature because he was convinced that the methods foundational for mathematical probability in social science must be identical with those used in the physical sciences. This basic flaw in his method did not go unnoticed. Social theorists like Comte, and John Stewart Mill protested against this absurdity (Daston, 1988). In spite of this critique, or perhaps in ignorance of it, Marx adopted Quetelet's method (McDonald, 1993) in the development of a scientific socialism. As we shall see in the next Chapter, Francis Galton made similar assumptions in his reorganization of mathematical probability in the development of eugenics.

Quetelet renamed the true value the 'average man'; an entity that Gordon (1991) suggests was philosophically closer to Plato's pure form, than to the later Weberian ideal type. At the conceptual level the construction of the 'average man' was merely a new form of the ancient idea of the male as the model human, and the eighteenth century reasonable man as the standard for judgments of good conduct. The particular male that Quetelet set up as an abstract model of the 'average man' was white, bourgeois, and European. Quetelet accommodated the notion of free will with the law of large numbers, stating that, "free will obliterates itself, and remains without effect, when observations are extended over a large number of individuals" (Mcdonald, 1993:256). The regularities in frequency distributions were due to many individual little causes, thus statistical laws derived from the application of the curve of error, were still somewhat deterministic. The chaos implied by the chance occurrence of variations in human bodies (or behaviors) within any given category, could be tamed by burying the effect of that variation in the mass of bodies that made up a category within the larger social body (Gordon, 1991, Hacking, 1990). The most important point in Quetelet's methodology was that he assumed that the frequency distributions of all human traits, whether 'real' or conceptual, would have a mean and dispersions from the mean. Therefore they would be normal distributions and form a Gaussian curve, whether of not those traits were actually measured or measurable (Hacking, 1990).

The physical, mental, or moral characteristics of the 'average' in any human collectivity became the governing law for all members of that collectivity.[21] If we take the example of skull size that I used above, the probabilistic universal law developed from the compilation of skull size measurements was that in any population male skull size would be larger than female, and since skull size indicated brain size, and brain size caused high intellect, the male 'average man' was smarter than the female 'average man', by natural law, not circumstance. The actual 'fact' ignored by this method is the 'natural' relation between skull size and overall skeleton size; the social 'fact' ignored is the effect of the exclusion of women from institutions of learning. The example that I have used here makes it appear that Quetelet's mathematical probability was both more concrete and more credible than was the case. Constructing an example within a contemporary conceptual space also makes the example hint at correlations. Correlation was not a part of probability methodology at that time. Quetelet, like other probablists was searching for causal law; a law that, in my example, would establish the correctness of the hypothesis that men were more rational than women. In this way belief and opinion based on experience, became fact based on a scientific methodology.

Daston (1988) marks Quetelet's work as the point in mathematical probability when social knowledge grounded in experience (subjective) was separated from social knowledge based on the power of the number (objective).

Quetelet's philosophical framework for mathematical probability, if not his specific method, achieved credibility because of the textual context within which it was proposed. Given the lingering power of the Newtonian paradigm, and what I have proposed as the necessity for cosmic-human harmony, Quetelet's proposals, that society was governed by moral 'forces'; that the average man functioned as the centre of 'gravity' in society; and that individual will and action oscillated around a mean just as physical systems oscillated around an 'equilibrium state' (Daston, 1988), brought social science into harmony with the physical sciences, society into harmony with the universe. Mathematical probability based on compilation of facts and distributions was adopted in natural/medical science to divide living organisms into the 'natural'/healthy, and the 'unnatural'/diseased (Hacking, 1990), and as Danziger (1992) points out, was enthusiastically embraced by the experimentalists in psychology. The combined effect of this coherence in methodology, across medicine, social science and psychology, strengthened the legitimacy of concepts of masculinity and femininity, the division of labor and separate spheres based on those concepts and the increasing separation of bodies and sexualitities, by providing a condition of possibility for the fusion of the biological body (sex) with the social body (genderings).[22]

At the level of the body, an 'average man' standard could be established with variations identified. These variations, could be socially controlled or contained to maintain a sense of the orderly nature of human bodies. The natural female had ovaries, evidenced by menstruation. Menstruation was a process that could be observed, measured for frequencies, and graphed to yield a normal distribution curve. Most European women in the bourgeois and upper classes did menstruate with some regularity. Therefore, the curve for this collectivity across specific cultures within Europe/Britain, would be very narrow with little variation. Applying the 'average man' theory, it was possible to say that the presence of the ovary was the governing law that defined a body as both female and feminine, and established a standard for womanhood. In another culture, or among the lower classes, particularly a culture/class that lived at absolute subsistence with frequent pregnancy and/or long periods of lactation, the curve, if it could be constructed at all, might be very flat with a great deal of variation. Females in this culture/class could then be defined as unnatural, 'primitive', or less than human by the objective standard obtained from statistics. The subjective standard for womanhood arising from prejudice, misogyny or the lingering probability of expectation among some probabilists, was converted to an objective scientific fact. The fluidity of the boundaries between masculine, feminine and psychic hermaphroditism was hardening. The manly-woman was no longer an object of virtue or satire. She, and the hermaphroditism and tribadism with which she was associated, became representations of nature out of control, of the unnatural, diseased. The conceptual closure of this masculine-hermaphroditic-feminine fluidity led to the opening of a conceptual framework for rigid divisions between persons participating in procreative sex acts and those involved in the non-procreative sex acts of sodomy/tribadism (Katz, 1995; Mason, 1994).

If we return to Ian Hacking's (1990) three modes for the process of applying probability theory to the study of life, Quetelet's work gave substance to the idea that there were laws governing social phenomena that could be be proposed a priori and tested by the application of a specific mathematical methodology. The fundamental standard, for the parameters of these laws, was the characteristics and behaviors of the white, European, bourgeois male constructed mathematically as the 'average man'. The boundary conditions for determining uncertainty in order to make inferences about human bodies and behavior, would not be fully developed until later in the nineteenth century in conjunction with a reorganization of the concept of time, and a conceptual revolution in natural science.

The voyages of discovery initiated by the rise of mercantile capitalism introduced European man to a variety of different kinds of human beings, and a great variety of new plant and animal species (Schiebinger, 1993). The natural sciences, that had by the eighteenth century broken away from the traditional Church based epistemology of a divine creation, were searching for a way to explain the fossil samples now being gathered from distant continents, and the resemblances between the great apes and types of 'primitive' humans. The idea of species evolving from a primitive to a more advanced form was beginning to develop at the same time that mathematical probability was reorganized and incorporated into a social science, and that medical and natural science were making 'discoveries' that divided humans into more explicit male and female creatures. As I will show in the next chapter, Darwin's systematic theories of the origin of species, and the particular descent of man within that system, would bring evolution, mathematical probability and the two sex model together in a conceptual revolution that would totally change the concepts of male, female and sexuality, and the relationship of those concepts to the concepts of masculine and feminine.

NOTES

1. For example, The Royal Society founded in London in 1660; The Academie Royale des Sciences in France, 1669.

2. Alchemy, and the principles of magic originated in ancient Vedic and Persian texts, and were embedded in Hebrew mysticism, Greco-Roman mystery religions, and gnostic Christianity where the 'real' god of the universe was a hermaphroditic first cause embodying all masculine and feminine characteristics. The two central metaphors of Alchemic literature and iconography were the hermaphrodite, and victory over the feminine. See Roberts, 1994; Tuana, 1993; Noble 1992; Merchant, 1983.

3. Eisenstein (1993:16) illustrates the dramatic effect of this invention with the comparison that in one year (1483) the Ripoli Press produced 1,025 copies of Plato's Dialogues, whereas, in one year, a scribe would have produced one copy.

4. A few women were able to attend the University in Italy and Germany in exceptional cases. However they continued to be excluded in France, and in England until the mid nineteenth century. Schiebinger, 1989.

5. There is a long history of shamanism, Dionysian and Dianic cults of Asian origin, and indigenous belief systems and rituals, that continued to function among the peoples of Europe as a subtext to both the Christian heresies, and orthodox Church. Sodomy, as both a male and female perversion, as well as adultery, and fornication were linked to both the pagan and heretical rituals. Augustine had developed the formula sin = perversion = evil, and later theologians extended that to evil = satan/devil. Magic was both 'white' (alchemy, hermetic and herbal arts), and 'black' (spells, necromancy, shamanistic journeying etc.). Women were involved in the paganisms and heresies during the eleventh to thirteenth centuries for many of the same reasons that women were attracted to the early ascetic Christian sects. By the end of the fourteenth century, the Churchmen had blended all of this together so that the formula read, sin = perversion = evil = devil = woman. See for example Barstow, 1994; Cohn, 1993; Kieckhefer, 1991; Shulamith, 1983; Evans, 1978; Kors & Peters, 1972.

6. Bordo, 1994:8 makes the point that the "revisioning of the universe as a machine" was a combined conceptual process of philosophy, anatomy, and astronomy. Descartes, in particular, integrated the metaphors within these fields into one single view of nature.

7. The connections among the theories and methodologies presented here, the concepts of masculine and feminine, and sexed and sexualized bodies cannot be captured in a linear format. I will develop the discussion of probability theory in the last section of this Chapter, Descartes' philosophy within a discussion of the Querelles des femmes in Chapter Four, and the affect of the Newtonian universe and concept of timeless equilibrium in Chapter Five.

8. Vesalius, Tabulae Sex, 1538; Epitome, 1543. See Shildrick & Price, 1994.

9. Realdo Colombo, De re anatomica, 1559. Gabriele Fallopia also claimed to have discovered the clitoris. However he is better known as the one to discover that the horns of the uterus were really tubes leading to the ovaries; organs that previously were called female testes. Falloppia did not discover the ovum, that would require the microscope.

10. The sumptuary laws in Europe made malefemale, and cross class, cross-dressing illegal, whereas in Britain the law only pertained to cross class. See Garber, 1992; Brundage, 1990.

11. This anxiety reflects back to the anatomical discovery of the clitoris, for if the hermaphrodite was classified as female with an enlarged clitoris, then 'she' was potentially a tribade with pretensions toward masculine status. In 17th century England the anxiety would erupt into satire and a pamphlet war about the cross dressing Hic Mulier (Man-Woman), and Haec Vir (Womanly Man). See Daston & Park, 1995:431; Achinstein, 1994.

12. The issue of size reveals that measurement was becoming a practice of observation in anatomy.

13. The idea of establishing difference by repeated measures of a 'part' across a number of post mortem individuals was now fully integrated into medical science. See Schiebinger, 1989.

14. J.J. Rousseau, 1762. Rousseau's novel Emile reflects the Romantic reaction to mechanistic science, while at the same time representing the male and the female based on that 'science'. His natural woman (Sophy) was to be socialized/educated as a passive wife and mother, while his natural man (Emile) was to be socialized/educated to enhance his genius for reason. On Emile see Zerilli, 1994; Schiebinger, 1989:220. For women's reactions see Catherine MacCauley, "Letters on Education" in Bell & Offen, 1983; Mary Wollstonecraft, "A Vindication of the Rights of Woman" in Todd, 1993/

15. The discussion that follows here and in Chapter Five is drawn from Gigerenzer et al, 1989, Daston 1988. I found that these texts along with Hacking, 1990 were the least technical and most socially oriented 'histories' of probability available.

16. The connection of this redefinition with bourgeois mercantilism, trade and colonialism is obvious, but it also applied to the nobility who were seeing their privilege and advantage undermined, and to the elite group of women who were promoting education for women. There was not yet a statistical base for quantification, so women's arguments, like men's, relied on the moral aspects of reasonableness. See Steinbrugge, 1995.

17. I am not claiming that the actual living out of divisions of labor, and separation of spheres of activity was consistent. Those arrangements, and the criteria for masculine and feminine are highly localized and culture specific. I am maintaining that the conceptual framework, determining that concepts and social arrangements would take a certain form, had a tendency toward constancy because these concepts and arrangements were seen as contributing to a cosmichuman harmony, that was implicit in cosmology and social theory.

18. Condorcet, 1792, Elems du calcul des probabilities, in which he coined the term 'social science'. Mcdonald, 1993.

19. Germaine Necker de Stael-Holstein coined the terms 'political science', and 'public opinion'. McDonald 1993.

20. Sur l'homme et le developpement de ses faculties, ou, Essai de physique social. This was translated into English in 1842, followed in 1846 with Letters on the Theory of Probability. See McDonald, 1993/

21. For Quetelet, the collectivity did not mean all of humanity, but rather a race, a class, or a 'sex'. Hacking, 1990.

22. For an excellent discussion of the transformation of the concept of human nature into the concept of normal in medicine, see the transcript of the Canadian Broadcasting Corporation, 1995, Modes of Thought, page 39-43, discussion with Ian Hacking.

Chapter IV. Man the Animal: Creating Opposite Sexes

A conceptual[1] revolution is the replacement of one system of thought, or framework for knowledge production, with another; a replacement that has broad epistemological consequences. (Thagard 1992). The conceptual systems within an harmonic alignment between the cosmos and the human, presupposed that the human had a special relationship with the creator god, or gods. In the Greco-Roman world the gods-goddesses/emperor-god were integrated into all aspects of daily and/or intellectual life. In the Hebrew world the god-human relationship was a covenant; for Christians the imago dei.

The 'scientific revolution' in the sense of widespread epistemological and methodological change, was more of a conceptual reorganization (Thagard, 1992) than a revolution. Science maintained an abstract god as the master planner of both the cosmos and the earth world, inserting nature as the microcosmic world situated between man and god. 'Man' was in charge of rendering this intermediate world of nature (and thus ultimately god) intelligible in order to use its resources (cf. Wertheim, 1995; Tuana, 1993; Schiebinger, 1993; Noble, 1992). Up until the mid-nineteenth century, the men of medical and natural science did not entirely abandon the idea of the human body as a microcosmic mirror of the divine. Men of science sought the relationship among the parts of the cosmos, and between the cosmos and nature, nature and man, and man and the social body through the mathematical formulas of deterministic causal laws (Wertheim, 1995; Schiebinger, 1989, 1993; Hacking, 1990). Quetelet's 'average man' was the imago dei in a neo-Platonic pure form from which all real humans diverged as poor copies (Gordon, 1991; Gigerenzer et al, 1989). The nineteenth century reliance on statistics and probability for descriptions and explanations of human/social activity and personality , attempted once more to establish a harmony with a mathematically conceived universe (Wertheim, 1995).

In this chapter I will discuss the impact of the Darwinian conceptual revolution in natural science on the concepts of masculine, feminine, male, female, and sexuality. As I stated in the last chapter, these individual concepts were, by the mid nineteenth century, incorporated into a concept of sex-difference. Two inter-related methodologies were being used to establish this conceptual joining of characteristics, behaviors and bodies; empirical observation of body parts in situ, and deductive reasoning based on the calculated relationship of individual body parts and/or processes to social phenomena. The study of sex-difference was diffused over several knowledge disciplines, rather than being centered in theology (moral-divine), or natural science/medicine (body).

Each of the newly developing disciplines, psychology (mind), sociology/anthropology/political economy (moral-social-culture), and sexology (sexuality) was seeking legitimacy as 'science' by developing methodologies and methods that would align it with the natural sciences, particularly Physics. Physics represented the purity of science in both its male homosocial milieu, and its recognition that truth resided in the power of masculine reason (Wertheim, 1995). The use of demographic frequencies and the calculus of probability to invent morally positive, universal causal laws in regard to the human and social body, was an important part of the legitimating process as natural science and philosophy differentiated into a variety of disciplines (Gordon, 1991; Danzinger, 1990, Halfpenny, 1982). As the mind-social-culture aspect of the study of living beings was incorporated into the anatomy-physiology aspect of natural science/medicine, a new science of life emerged called biology (from bios = life + logy = study of) (Foucault, 1970). Each of the newly developing disciplines was founded on the epistemologies and methodologies of the study of living beings. Therefore, sociology, sexology, psychology and political economy were all 'biologies'; ways of studying human life.[2] My focus in this chapter will center on the biologies that gave rise to a concept of 'opposite' sexes.

The first section of this chapter will examine some of the conceptual events and knowledges that were necessary for Darwin to formulate his theories. I have already addressed one of those conceptual events; the developments in statistics and mathematical probability that created the 'average man'. To be intelligible, Darwin's theories also required the eighteenth century work of Cuvier in comparative anatomy (Major-Poetzl, 1983), the Malthusian ideology of social-sexual responsibility (Nicolson, 1992), and a new conceptualization of time (Prigogine & Stengers, 1984). The second section of the chapter will briefly review the nineteenth century status of women's relation to the written word, and the hermaphrodite as a shadow behind constructions of the concepts of male, female, and sexuality. Following the development of a context for Darwin's work, I will outline his theories, and the new conceptual model of the 'sexes' that emerged from a Social Darwinism,[3] that justified a scientific status for Darwin's conclusions through further developments in mathematical probability A brief look at the aftermath of Darwinian theory will complete the historical narrative.

The Power of Naming

Categorization through classification of kinds of living beings, provided one means to establish a sense of order in an otherwise chaotic natural world. During the eighteenth century natural scientists followed a method of mechanistic atomization to classify humans, plants, animals, birds and reptiles on to a grid based on resemblances among forms, position, number, and substance of external body organs and structures (Foucault, 1970). This method of creating identities (i.e.: genus, family, species) required qualification through observation, and quantification for a rank ordering. The result was taxonomies that relied on what was easily seen, counted or measured (Schiebinger, 1993; Foucault, 1970). In human anatomy this meant skin colour, external genitalia, height, skull size and so on. To position the human on the taxonomic grid, visible parts became the essence of the human male and female to be matched by comparison with similarities among the male and female of other species. In the previous chapter I illustrated this surface taxonomic process with the 'discovery' of the clitoris as an essence of the feminine/female linked analogously with the male penis. In general the taxonomies were flat, horizontal and descriptive devises that did not link surface identities with internal organs or processes (Foucault, 1970). This flat surface classification could not account for origins of species, explain why different species might have parts in common, or determine the position of fossils in relation to living beings.

To divide humans from species of apes[4] that appeared to have features and behaviors closely resembling encountered 'primitive' humans, natural scientists classified the apes according to a male-female asymmetry. The male ape differed from the human male based on the ape's lack of reason.[5] The female human differed from the female ape based on the presence of the hymen and clitoris, the angle of the vagina, and suffering in childbirth. (Steinbrugge, 1995) On the taxonomic grid, the human male resembled no other creature because of his unique social characteristics, the human female resembled lower creatures with distinctions made according to sexual anatomy (Schiebinger, 1993). The essence of masculine/male was reason-mind, the essence of feminine/female was body parts. This positionality on the taxonomic grid, also separated the 'civilized' human from the 'uncivilized'. For example the categories of 'foreign' or lower class females were positioned on the taxanomic grid by their divergence from a correct body type,[6] determined by the privileging of the Caucasian race in its bourgeois form. The conceptual context for Darwin's theories of evolution privileged concepts of masculinity, constructions of maleness, and assumptions about the superior value of procreative sexuality. This privileging was no longer a matter of myth or expectation. By Darwin's time the privileging was based on 'fact' derived from the use of statistics in the sciences of living beings.

The work of Cuvier[7] (1769-1832) that bridged the late eighteenth and early nineteenth centuries, overturned the taxonomies by returning the focus inward, giving primacy to the hidden forces and causes of internal organs and processes (Foucault, 1970). This incorporated physiology back into the classification systems. Although Cuvier's work is cited in histories of the body, and concepts like male and female, the impact of his thought on the possibility of an evolutionary theory is often neglected (Major-Poetzl, 1983). The change of focus from external to internal features as essences was illustrated in the last chapter with the switch from the clitoris to the ovary/menstruation as the essence of feminine/female.

In the taxonomies the organ (part) was defined by its structure and function read through its role (reproduction), or its morphology (form, number etc.). Role and morphology were seen as independent of each other. Curvier blended role and morphology giving the function of the organ prominence over its structure. This allowed natural science to study organic systems such as locomotion, reproduction, digestion and so on (Foucault, 1970). Cuvier demonstrated that one organ could not function without the existence of other organs, and that a modification in one organ caused a modification in other organs. The functions and modifications of whole systems were determined by both the environment, and by the life processes internal to the species. This changed the concept of human nature from a relative position determined by resemblances in horizontal external space, to a concept of human nature that dwelt within an internal space where anatomized parts were in mechanistic relationships to each other. Humans were not just in nature, they had a nature that was objectively measurable in the same mathematical terms as the nature of inanimate objects. Species could be related according to mechanistic systems where knowledge of one part inferred the architecture of the whole (Foucault, 1970) For example a wide pelvis would not just identify a creature as female, but also infer a particular systematic reproductive process and arrangement of internal, and external organs. From measurement came laws of the body. Measurements of the width of a pelvis or size of a skull, without any flesh attached, could determine the whole body structure, systems, and appropriate social category. Foucault (1970) marks this conjunction of parts to systems as a beginning for the study of life (bios). Wertheim (1995), marks the potential for human bodies to be placed within mathematical systems of causal laws as symptomatic of the triumph of the 'number' that gave biology its status as a science. I would argue that on a more material level, this change in perspective in classification of species reflected changes in economic and political conditions where the anatomized individual (part) was being incorporated into industrial systems of production, and where the post-revolutionary individual now had to be situated within a political system of citizenship and rights.

Using the technique of comparative anatomy, Cuvier insisted that the ape was a different species than man, rather than a gradation on a grid from 'primitive' to 'civilized'. If the characteristics and behaviors of the apes resembled some of the characteristics and behaviors of primitive 'races' of man, then 'race' must be the external manifestation of a different internal system, and a factor that separated humans into different species (Schiebinger, 1993). In the same manner, based on measured differences in organic systems, the human male and female could be distinct species, not gradations of inferior and superior man. In addition, this new way of classification introduced the idea that any organic system had both an inside and an outside that interacted. The external environment (air, water, food) interacted with and determined the function of organs, and therefore created the conditions of life. Although Cuvier did not believe that any species had changed since its original creation, his ideas implied that if environments could be historicized by soil, climate and vegetation variation, then species could also be historicized. As I will demonstrate, Darwin developed his early theories about species within assumptions derived from the context of Cuvier's comparative anatomy. However, Darwin initially was not able to demonstrate a mechanism that would explain the emergence and disappearance of species over time, or how reproductive systems would directly affect species change. Darwin found the answers in the writings of Thomas Malthus (1776-1834).

Gnosticism Revisited

McDonald (1993) credits the population theories of Malthus as the opening of the nature/nurture debate. Gallagher (1987) enlarges on this idea by situating Malthus' theories in his antagonism toward the utopian notions of Condorcet, Godwin, Wollstonecraft and Paine, all of whom believed in the perfectibility of society through the perfectibility of individual bodies. Natural human progress was evident in the spirit of progress of the social body indicated by population growth. For the post-revolution utopians, the healthy body was a reproducing body; a sexual body. The possibility of passion between male and female was valorized as free will unattached to lineage and property concerns, and largely detached from marriage. Social relations, like personal relations, could be managed so that all men and women reached full human potential.[8] Malthus had no faith that individuals left to their own devices would achieve perfection, or contribute to social progress (Gordon, 1991).

In a distinctly gnostic turn, Malthus separated the body from the spirit, locating the body and sexuality as sources of moral and socio-political danger (Nicolson, 1992). For Malthus the body/spirit split was the separation of the social body into the lower classes (matter-body) and the propertied classes (spirit-mind), and the individual body into sexuality (matter) and reason (spirit). By analogy the corruption of society lay in the unbridled sexuality of the lower classes (large families) that contrasted with the reasoned limitation on sexuality of the propertied classes (small families). Population growth took on the cloak of original sin, rather than being a vision of utopian progress. Nicolson (1992) states that in Malthus' texts the term 'population' was a code word for 'sexual'. From this perspective the solution to population growth was repression of the sexual appetite among the lower classes, and encouragement of selective breeding among the privileged classes. Both the notion of selective breeding, and of sexual appetite as a force in nature, influenced Darwin's theory of sex-selection.

It was Malthus'[9] incorporation of these ideas of sexuality into an economic theory, privileging a mathematical view of life that supplied Darwin with the mechanism whereby a species would vary, become extinct, or evolve into a new form. Malthus proposed that the production of food increased arithmetically, while population grew expotentially. Therefore unless population was checked, the number of people would exceed the food supply available to sustain them. The struggle for life resulting from unchecked population growth would reduce society to Hobbes[10] 'war of all against all', embroiling spirit (reason) in the corruption, death and decay of matter (body). Malthus' struggle for life, in the face of inevitable death of the human species through unmanaged sexuality, was the source for Darwin's theory of natural selection.

The Meaning of Time

Changes in the perception of time were concurrent with developments in comparative anatomy, Malthus ideas of social-sex responsibility, and utopian optimism. Eighteenth century romantic notions of the perfectibility of human nature and civilized society introduced the idea of the future, and possible change, into conceptual frameworks that had been largely concerned with the revival of past authority and stability in the cosmic and natural worlds. Equilibrium was the watchword in the Newtonian paradigm, mathematical probability of expectation, efforts to classify living beings into hierarchical grids, and political contract theories. As noted previously, the events surrounding the French Revolution marks the point where established hierarchical stabilities were shattered, disrupting harmonies.

The perception of timelessness, or reversible time, was derived from Newton's theories of stable equilibrium, the glorification of the Hellenic past, and the utopian sense that humankind could still reverse the social chaos of industrialization.[11] In the natural sciences the evidence from fossils and the wide variety of kinds within species complemented Romanticist notions of perfectibility implying that time was moving forward.

Theories of an evolution of living beings and whole societies from a primitive source, and the possibility of a recapitulation of each life or society from the primitive (infancy) to the civilized (adulthood), structured the forward thinking that would be the hallmark of the nineteenth century. In the physical sciences new discoveries were occurring that would disrupt the Newtonian paradigm, reinforce forward thinking, and create the conditions for the reorganization of time as irreversible (Prigogine & Stengers, 1984, Grosz, 1995). This reorganization of the concept of time and its impact on the concept of sex-difference in gendering will be addressed in Chapter Five. The issue in the change in the concept of time was whether the motion of time was leading to an increase in order, or an increase in disorder. Darwin's theories would suggest that time was moving toward increasing order. However, much of Darwin's theories had no scientific basis as truth claims because, lacking knowledge of a mechanism for heredity, both natural and sex selection were conjecture. To overcome conjecture, that is to attain a degree of certainty about heredity, Galton using Darwin's theory turned to mathematical probability. Francis Galton and Karl Pearson reorganized mathematical probability to provide scientific proof for Darwin's conclusions about sex difference, heritability of social characteristics, and the forward movement of time. All three ideas came together in Social Darwinism/eugenics.

The concepts and methodologies necessary for the conceptual revolution created by Darwin's theories of evolution were all in place by the 1850's. The 'average man', numerically constructed to represent a pure form, supplied the standard for the final product of an historicized 'man'. Cuvier's comparative anatomy provided the means to determine a species, and kinds within species, and Malthus' notions of sexual appetite and food-to-population pressures supplied a basis for mechanisms of selection. However, Darwin's theories did not develop in a power/knowledge-cultural vacuum. Before examining the relationship of evolution in general and Darwin's theory in particular, to sex-difference, two issues need to be looked at; the hermaphrodite, and women's relation to the written word.

Hermaphroditic Notions

If we accept the premise proposed by Laqueur (1990) that a one sex model persisted until the eighteenth century, then the discussion in this chapter is the continuation of a process of separation that re-constructed 'man' into a male creature marked primarily by a capacity to reason, and a female creature marked primarily by sexual anatomy. This has been narrated, out of necessity as a continuous linear process in order to highlight conceptual changes that constituted, and reconstituted the criteria for difference between the male and female. The emphasis in this discussion of the concepts of male, female and sexuality has been on the form of difference used to mark bodies as male or female, and sexuality as procreative and non procreative. Sameness, as either sex-complimentary (qualified difference), or unity (non importance of difference) was also proposed by medical theorists and philosophers during the time period discussed (see especially Allen, 1985). Plato's temporal egalitarianism is but one example of these tendencies. It was within the tension between sameness and difference that the hermaphrodite continually emerged as the symbol for either unity/complementary, or polarity; as monstrous perversion or living example of bisexual harmony (Garber, 1995).

Moscucci (1991) locates the hermaphrodite, in early nineteenth century discourse, within the concepts of democratic choice, at the divide between nature and culture. Foucault (1980:viii) states that new theories developing out of the study of life, in addition to increasing the need for administrative control of sexuality, led to the idea of a 'true sex'. Each person through the evidence of reproductive organs, and/or function, must "have one and only one sex". By the end of the nineteenth century this meant surgical intervention on hermaphroditic bodies, and a denial of any ambiguities in human nature. Democratic principles in general, and women's emerging demand for a place within a democratic social order, challenged forms of masculine authority at the level of family (private) and society (public). From the point of view of the anti-feminists, it was essential that the divisions of labor and separate spheres of the male and female be articulated and legitimized by science. At the same time too great an emphasis on sex-difference might have the effect of "obscuring racial categories and undermining the unity of the human species in relation to the lower animals" (Moscucci, 1991:177). The hermaphrodite modified sex-difference by allowing for the possibility of a common human nature, a middle ground of bisexuality (Garber, 1995). From this point of view, sex-difference could be seen as a matter of degree, rather than essences. This temporarily resurrected the ancient notion of homologies between male and female organs that now extended to discussions of 'male' menstruation, and 'male' breasts.[12] These hermaphroditic speculations, along with the one sex model, were overturned with Darwin's *Descent of Man* in 1871. For Darwin, the hermaphrodite was the primordial ancestor of all living beings. Dimorphic sex-difference was evidence of organic progress; hermaphroditism was evidence of organic reversion to the primitive (Garber, 1995; Moscucci, 1991). With Darwin the hermaphrodite, as androgyny or bisexual, temporarily lost her/his place as an object of natural science study. He/she would reappear later in the nineteenth century within sexology and psychoanalytic theory, and again in the twentieth century, first with the rediscovery of genetics, and then later within psychology as a model for the concept of gender (Garber, 1995; Ebert, 1995; Haraway, 1991).

The Defense of 'Woman'

Women's relation to the written word, that is their level of literacy and direct involvement in anatomical-physiological, or science discourses, varied a great deal across European/British cultures after the invention of the printing press and the wider distribution of textual representations of male and female bodies. It is impossible to generalize, and I want to avoid bringing forth exceptional women to represent 'woman'. The one area that can be used to incorporate women's use of the written word into the development of ideas that constituted sex-difference, is the Querelles des femmes.[13] The style and content, of this nearly 400 year literary debate on women, changed as the conceptual frameworks and methodologies that structured knowledge were organized, and reorganized. Both the 'feminist'[14] and anti-'feminist' arguments incorporated concepts of masculinity and femininity and the nature of the male, the female and sexuality, as those ideas filtered into popular discourse from theology, natural philosophy and medicine.

The humanist poet and political commentator, Christine de Pizan (1364-1431) can be credited with the first secular texts that defended the virtue and value of woman, and made an argument for the legitimacy of women in higher education (cf. Willard, 1984). A contemporary of Jeanne d'Arc, Christine took her place in public by declaring herself a manly-woman, but unlike Jeanne, she did not cross-dress, and therefore avoided Church persecution (Willard, 1984). Christine's arguments on behalf of women were situated within knowledge about the male and female from the thirteenth century compromise of Albert Magnus. She defended women against the female-as-imperfect-male, while at the same time using the Augustinain view that female chastity was a model against which one could denounce the male based on his lack of control over his sex organs. Christine's format for her defense of woman was the allegory framed within the common Medieval devise of the compilation of ancient mythological and Biblical heroic worthies; in this case women worthies. The critics of her conclusions simply turned her work around to show that such female worthies were in the past, unrelated to the fifteenth century woman (Mclean, 1977). The debate with Christine de Pizan launched the Querelles des femmes.

During the sixteenth century the format of the debate changed to dialogue and parody, under the influence of neo-Platonism, women's patronage of the Arts, and a revival of the courtly love ideal of female control over male lust. In general early Renaissance writings were favorable to women (Mclean, 1977) because of the revival of a neoPlatonic notion of essential harmony underlying all cosmic and human relationships. References to the female body were based on Medieval texts, so 'favorable to women' should be read as a repetition of Christine de Pizan's valorization of womanly virtues used to counter sexual taint and the imperfection of the female reproductive organs and process. Over the first half of the seventeenth century, the form of the debate shifted again, this time to satire and polemic (McLean, 1977). In Europe the polemical writing now focused more clearly on learning and education as women sought entry into the new 'sciences', and men attempted to both encourage this interest, and set boundaries[15] around it (Phillips, 1990; Schiebinger, 1989). In England, the seventeenth century Querelles was more satirical. The emphasis was on cross-dressing and ambiguity of bodies in drama and the pamphlet 'wars' that emerged from the medical scrutiny of the hermaphrodite. Much of the contents of the debate were in reaction to the abrupt social changes occasioned by shifts from a virgin Queen (virago), to a bisexual King (sodomite), and then to a puritan Protector (asexual) (Harvey, 1992; Henderson & McManus, 1985). English women were considerably less vocal than European women during the early seventeenth century. This reflected both the repression of the Civil War and Cromwellian era in England, and the fact that European women of the upper classes were being selectively admitted to public spaces; a trickle of entry to Universities, involvement in the sciences of plant life and alchemy, and patronage of scientific developments within the salons (Harth, 1992; Phillips, 1990).

A critical change occurred in the latter part of the seventeenth century that reconstituted the Querelles during the eighteenth century. The Cartesian mind/body split introduced methodological doubt into the subject of female inferiority in both medical science, and literary-philosophical texts (Steinbrugge, 1995). The argument from both 'feminist', and anti-'feminist' positions turned away from the empirical evidence of anatomy-physiology toward the intellectual preconditions for male-female equality. For the Cartesians physical differences at the level of the body had no influence on cognition (Harth, 1992). Therefore reason/mind had no sex (Steinbrugge, 1995; Schiebinger, 1989). This meant that the focus of the debates was on the power of men to claim the superiority of masculine reason over feminine irrationality. Both rational man and irrational woman were judged according to immutable principles derived from ancient mythology, Christian doctrine, and the mathematical probability of expectation. In order to overcome the Cartesian logic of 'the mind has no sex', feminine irrationality had to be reconstituted in the materiality of the body; either by the empirical evidence of a smaller brain, or by deductive evidence that a feminine form of rationality was based on intuition and emotion tied to her reproductive organs and functions (Schiebinger, 1989). 'Maternal' became a code word for the particularity of the female mind (Steinbrugge, 1995). To counter these arguments, 'feminists' valorized the female body and the maternal in order to create a complementary between the particularity of a feminine rationality and the abstract universal idea of a masculine rationality (Harth, 1992). This forced the Querelles into the debates about the nature of human nature, motherhood, and socialization that we saw with Rousseau's work. The contents of the eighteenth century Querelles influenced the concepts of masculine and feminine by contesting both the foundations for these concepts, and the divisions of labor and separate spheres derived from these concepts. Overt discussion of divisions of labor and public and private spaces, in both the social and intellectual sense, now entered the debates. Harth (1992) points out that the tensions in definitions of rationality arising in the latter half of the seventeenth century contributed to the demise of the salon as a source of women's involvement in the development of science, and the refusal to admit women to the scientific academies and societies. Women were excluded from organized science, and therefore excluded from the visible production of knowledge that structured theories of the universe, time, evolution, and the construction and representation of their bodies.

The virtue and value debates of the Querelles des femmes became the post-revolutionary era debates on the Woman Question, with the introduction of the concepts of citizenship and rights. The Woman Question, from the 1790's onward, combined mind and body issues within both empirical and rational arguments. By the time of Darwin's writing, it had generally been forgotten that the rationalist argument began with the premise that rationality/intellect was sexless. Darwin therefore, was able to make intelligence a tertiary sex characteristic that was attributed differently to male and female bodies. The *Querelles des femmes* was, as Gerda Lerner (1993) demonstrates, a source for a feminist consciousness, that in providing a sense of community at a literary-philosphical level, created the conditions of possibility for feminist activism. When Darwin published the *Descent of Man* in 1871, women's defense of 'woman' had moved out of the pages of books, into the classroom, the workplace, the courts and the streets. To understand Darwin's work as a radical shift in the conceptual model of the 'sexes', it is necessary to view his work, not just as a conceptual revolution in natural science, but also as an integral part of the antifeminist side of the quarrel that began when Christine de Pizan demonstrated that women's use of the written word was a source for female power in the public realm.

Historicizing 'Man'

At the midpoint of the nineteenth century the mechanistic view of the body, as a working part of the machinery of both nature and society, coexisted with a more holistic faith in the Judeo-Christian creation myth and imago dei (Zimmer, 1993). Cuvier's comparative anatomy focused the study of the nature of man on the internal space of discrete organs and systems, but also suggested that what was external to the body determined human nature (Atterton, 1994). This gave rise to environmentalism. The fossil record, and evidence of 'primitive' races of man raised questions about the span of time in the creation of species. The concept of evolution arose out of the philosophies of the revolutions for liberty and equality that shadowed the Romantistist notions of the perfectibility of the human and social body. Perfectibility, in turn, required a standard value in order to judge the status of progress, and a method for predicting the outcome of change on both the human and the social body. Change in nineteenth century terms was chaotic as the social results of the eighteenth century growth of industrialism, and the upheavals of political revolutions reached a point of crisis in class divisions and human misery.

The first attempt at a systematic theory of evolution was put forward by Jean Lemarck in 1809. He proposed that living beings transmuted from the primitive to the advanced through an inherent tendency to increase in complexity by acquiring traits that were useful in an environment. These traits would then be passed on to progeny. For example the work ethic was acquired as humans learned to function in the environment of a capitalist economy. As civilization progressed the work ethic became an inherent part of some individuals; a heritable trait. The successful passing of this ethic to children through reproduction guaranteed economic progress, thus civilization. Lamarck's theory was rooted in the concept of taxonomies based on the visible continuities of surface structures of the body, and visible social characteristics and behaviors (Atterton, 1994). Humans became more complex in response to increases in civilization (Hawkins, 1995). From Lamarck's theory a racial and sex hierarchy was established whereby the European, entrepreneurial, male was the end product of a continuous civilizing process. As demonstrated in the last Chapter, Quetelet incorporated this model of civilized man into the mathematical abstraction of the 'average man'. The social theorist Herbert Spencer, based his idea of the survival of the fittest on the Lamarckian principles of evolution (Hawkins, 1995)

Darwin's experience of gathering data on living species among various environments, during his time (1831-1836) aboard the Navy vessel Beagle, led him to believe in the possibility of an evolutionary process. He was also familiar with the principles of selective breeding in animal husbandry through his agrarian lifestyle. However, he rejected the Lamarckian idea of an inherent mechanism for evolution situated in the individual. His breakthrough to understanding an environment based mechanism occurred in 1838 after reading Malthus' (1798) *An Essay on the Principle of Population* (Hawkins, 1995; Shipman, 1994). In the *Origin of the Species by Means of Natural Selection: or the Preservation of Favored Roles in the Struggle For Life*, published in 1859, Darwin explained the gap between population growth and food supply as a competition, a struggle for existence. This struggle led to adaptation and differentiation of species through a process he called natural selection. The mechanisms for evolution were in nature, not in a process internal to a species. Random mutations, resulting in particular traits, would occur in a living being that were then passed down to progeny through reproduction. Those traits that enabled a living being to be successful in the struggle for existence would be expressed more frequently because their progeny had a greater chance to live to maturity and reproduce. In 1868 Darwin elaborated a mechanism for heredity that he called pangeneis; a process where 'gemmules' from all parts of the body collected in the substances (sperm, ovum) that formed the embryo (Gigerenzer et al, 1989). Over vast amounts of time, living beings with particular traits would edge out less able competitors for resources. The most successful species would be those with a wide variation in traits to accommodate to a changing environment. Through natural selection whole species differentiated, or became extinct. All living beings evolved from an original hermaphroditic ancestor, and became increasingly sex-dimorphic in response to increasing environmental variation (Moscucci, 1991).

The theory of natural selection had much greater explanatory power for fossil records, and the great variety, and distribution, of plant and animal life, than either creationist or Lamarckian theories. In this sense, natural selection was a Kuhnian (1970) paradigm shift. It was also heresy. Darwin was denying the all-at-once myth of Genesis, implying randomness at a time when science was developing causal laws and methodologies to 'tame chance' (Hacking, 1990), and leaving open the question of 'man' as a standard for 'civilization'. In the closing of the *Origin of the Species*, Darwin hinted that, "much light will be shed on the origin of Man and his history" (Shipman, 1994:23). The shining of that light would not occur until twelve years later (1871), when Darwin acquired the courage to publish The *Descent of Man*, and *Selection in Relation to Sex.*[16]

In the *Descent of Man*, Darwin put humans in the evolutionary framework as a species of animal (primate, mammal) that had evolved from the hermaphroditic ancestor along with all other species. The human male was not a special creature created in the image of god, nor was the female created out of man's body in man's image. Further, in the struggle for existence, the pressures of environmental variation had impacted on males and females in different ways. Within the conceptual framework of Darwin's theory of evolution the human male and female were different historical species. In the uproar over Darwin's connection of the primate human to the primate ape, this severing of male from female, that tore the one sex conceptual model apart into two streams of history for the human body, was subsumed into the debates about origins and natural selection. The difference in the evolutionary history of the male and female centered on the reproductive process, in other words on embodied sexuality. The tendency toward sexuality as a criteria for difference among humans, that began with Malthus' reversion to both gnosticism and Augustinian principles of separation of procreation and desire, was repeated by Darwin disguised as a theory to explain the heritability of traits and to justify a male standard for the human species. The second half of the *Descent of Man*, titled *Selection in Relation to Sex* needs to be read within the context of the Woman Question, and the social impact of increasing feminist activism.

In the 1871 edition of *Descent of Man*, Darwin attempted to demonstrate that body structures and social and mental qualities, not directly involved in reproduction, were nevertheless, in Cuvier's terms, symbiotic with the reproductive system. Therefore those structures and qualities could also provide reproductive advantage in a changing environment. As Moscucci (1991) explains, this attached new meaning to both secondary sex and tertiary social characteristics and behaviors, bringing them within the human evolutionary process. All of these characteristics were established within a species over time through a mechanism called sex-selection. Sex selection worked in two ways; "either through the elimination of weaker males in the contest for 'wives', or through the exertion of choice by the females over courting males" (Moscucci, 1991:183). In the animal world sex selection explained the differences in size, plumage, and song between the male and female. In the human world, it explained the natural endowment of the male with great strength, aggression, reason and intellect. Males not so endowed would lose out in the competition for females, and females would tend to choose the better endowed males in order to guarantee the expression of those traits in their offspring. Organic success for the human species thus depended on sex-difference; a sex difference that originated in cues from the environment that affected sexuality, not in reproductive organs. This reintroduced the problem of free will within environmental contexts. If the environment changed, sex-selection mechanisms could change as well, putting sexuality in the control of man, not nature. If humans were allowed free will, it was entirely possible that over time they would, through choice, revert to the hermaphroditic ancestral type (Moscucci, 1991). The spectre of the manly-woman, and the womanly-man, of intermediate types and bodily perversions, disturbed the 'angel in the house', and 'cult of motherhood' ideologies that structured the economic division of labor, the separation of public and private, and the notion of progressive civilization. In response to this possibility, Darwin revised the 1874 edition of the *Descent of Man*,[17] by clarifying male and female difference in evolution in the chapter titled "The Origin of Sexual Differences" (Hubbard, 1979).

In the 1871 edition of *Descent* Darwin was connecting human evolution with the evolution of all species. To do so he concentrated on physical characteristics to differentiate the male and female. In the European context the secondary sex characteristics of facial hair, breast development, and menstruation were common among all males or females, but not necessarily immediately observable. Social sex differentiation, as a visible asymmetry between women and men within the cultural milieu, had become critical by 1874. Women were openly challenging ideas about masculinity and femininity, and women's 'place' by overturning marital property laws, protesting their exclusion from institutions of higher education, questioning male sexuality, and demanding political rights (cf. Spender, 1983, 1988). Renowned philosophic radicals like John Stuart Mill[18] wrote in support of women's demands, giving these demands a credibility that influenced the courts and social policy makers. Two methods were used to ground arguments for the continued subordination of the female in a scientific evolutionary framework.

First Darwin adopted parts of the Lamarckian theory of adaptation to the environment (Russett, 1989). From this perspective the strong aggressive male took prominence in sex selection. The male acquired and maintained superior strength in the struggle to possess females. The female was reduced to a passive state, ready to accept any male in order to fulfill her reproductive destiny. The reproductive process in the female, once it was established by the dimorphic split, completed female evolution. The female was thereafter exempt from the struggle for existence, remaining in state of stagnation half way between child and man, forever dependent on the male. Protected from the struggle for existence in a changing environment, female traits did not have to vary to the extent necessary for the male who did achieve full adulthood. The male acquired intelligence from his activities (hunting, making weapons). These acquired traits, strength and intelligence (male), passivity and readiness (female) enhanced advantage in the struggle for existence, and therefore progeny inheriting these traits through pangenesis survived to reproduce. By bending sex selection toward Lamarckian adaptation theory, Darwin used sexuality to reinforce the social position of men and women by removing the female from social adulthood, and removing female agency from the evolutionary process. Therefore by association Darwin separated the concept of female agency from the concept of 'civilization'. In conceptual terms, he had created two oppositional categories, 'man' and 'not man' (see Appendix A, Figure 2). Any move toward equality between the male and female could now be perceived as a reversion to a 'primitive' state, prior to the dimorphism which led to civilization. The issue of free will, and the unbridled sexuality which had disturbed Malthus, disappeared into the naturalness of male possession of females, and the naturalness of female readiness and passivity.

Feminist arguments against these naturalizations were caught in a catch 22 situation where arguments for equality, agency, or bisexual harmony appeared to be arguments in favor of de-civilization. One way out of this conundrum was to valorize feminine characteristics, and representations of the female body and its functions; the same move that eighteenth century women had made to overcome the reduction of their minds to the materiality of their bodies. During the last decades of the nineteenth century women, feminist and non feminist, reorganized the category woman putting 'Woman' in place of Darwin's conceptual category of absence 'not man'. There were several other options including internalizing the 'not manness', and creating separatist female spaces where 'not manness' would not matter. The possibility of any solutions to the Darwinian rendering of male and female into conceptual 'opposite sexes', would be limited by Darwin's colleagues and successors.

> We may also infer from the law of deviation from averages so well illustrated by Mr. Galton ... the average of mental power in man, must be above that of women. (Darwin, 1874, Descent of Man, quote in Agonito, 1977:251)

The second method used to ground female subordination in science emerged out of a reorganization of mathematical probability that situated male-female asymmetry in the pure 'science' of mathematics. The "Mr. Galton" referred to in the quote above was Darwin's cousin Francis Galton. Galton, along with his colleagues Karl Pearson and Herbert Spencer, provided a statistical method to categorize masculine and feminine social characteristics and behaviors and attribute them to male and female bodies respectively. This methodology also supplied a way to distinguish among males and females by race and class, and among sexual practices by their relation to the procreative average. Galton was not primarily concerned with Darwin's selection mechanisms within evolutionary theory per se. He focused on two issues, the element of chance implied by the randomness of mutations in natural selection, and the process of heredity (Hacking, 1990). Galton was fascinated by Darwin's idea that "any given individual would generally be determined by a plurality of gemmules" (Gigerenzer et al, 1989:56). He related the selection of gemmules forming an embryo to the eighteenth century classical probability of drawing colored balls from an urn,[19] and to Cuvier's notion that similar organic systems determined a species type in spite of external difference. In other words random events form a specific individual within a species, but these random events are determined by natural laws governing that species.

Galton agreed with Quetelet that most human traits have a normal distribution (curve) in a population; a curve based on the Gaussian law of the curve of error. But he did not accept that the regularities of normal distributions were determined by many little causes, or that the 'average man' (central tendency) accounted for statistical stabilities. Galton focused his heredity work on the dispersions from the average rather than on the averages, particularly the scores of 'excellence' in the extreme right tail of the curve. By applying the law of the curve of error to these deviations, he found two statistical phenomena; reversion to the average (regression) and correlations (Hacking, 1990; Daston, 1990; Gigerenzer et al, 1989). These statistical phenomena had considerable significance for the development of sex difference research, and the conceptual limits for feminist proposals of equality. First, Galton converted the concept of the 'average man' to the concept of 'normal', taking this term from physiology and medicine, and Comte's moral positivism and applying it to mental and social characteristics and behaviors (Hacking, 1990). Second, he made the concept of correlation as 'real' as the concept of cause through biometric measurement associations that he devised, in combination with the mathematical technologies of eugenics developed by his colleague Karl Pearson. I will elaborate further on the idea of 'normal' in Chapter Five in connection with the sexing and sexualizing of bodies.

In his 1869 publication *Hereditary Genius*, Galton correlated the historical records of 'great men' with factors that might be related to their greatness. He demonstrated that intelligence was related to good marriages. Gifted men selected women with family records of successful progeny; the combined effect yielded another generation of male genius (Shipman, 1994). From anthropometric surveys Galton correlated items like height with size of hands and feet, and found that many physical features could be predicted from knowledge of one physical feature. Galton extended this methodology to correlations between the categories male and female and social items like age of marriage or level of education. Quetelet had marked the frequency distribution curve into bar graphs to indicate differences in the percentage of cases within the curve. Galton used these percentages to talk about dispersions from the mean in a standardized form (Hacking, 1990). Thus he could say that 83% of a normal frequency distribution would fall within one standard deviation point from the mean. This set the boundary conditions for 'normal'.

What we need to note about Galton's work in biometrics and heredity, and Pearson's refinement of this work in eugenics, is that statistical laws became autonomous; that is not connected to determining causes, or to real individual bodies or social collectives (Hacking, 1990; Gigerenzer et al, 1989). This conceptual reorganization was based on Quetelet's original assumption that if frequencies of measured characteristics and behaviors, like marriage rates in a population, obeyed the law of the curve of error, so did all non-measured characteristics and behaviors like nurturing or aggression. This led in turn to the idea that all human characteristics and behaviors could be measured, if an instrument was developed to collect that data, and statistical technologies were applied. During the twentieth century personality psychologists would try, and fail, for 60 years to measure masculinity and femininity based on the idea that these concepts were 'real' and would be normally distributed in a population (Moraski, 1987; Lewin, 1984).

Within a deterministic conceptual system it was/is possible to say that the presence of ovaries causes femininity/femaleness. In the correlation conceptual system developed by Galton and Pearson, one could only say that the presence of ovaries was associated (correlated) with femininity/femaleness. Ovaries (variable A) are not the sole cause of femininity/femaleness (variable B), but contribute to it along with other deductively established variables C and D. When mathematical probability was applied to autonomous statistical laws in regard to social characteristics and behaviors, it became possible to predict the direction and strength of correlations, correlate the results with social phenomena, and then predict the effect of interventions. Pearson's goodness of fit technique, the chi test, refined this process by establishing a means to test which variables (A, C, or D) were strongly associated with femininity/femaleness. If the strongest association was ovaries (A) with femininity/femaleness (B), then persons in the population who had ovaries were not just feminine by chance; having ovaries was a probable cause of their femininity. A social intervention that interfered with femininity could then create a problem with the function of ovaries and ultimately affect the birth rate. Given that femininity was a concept that structured divisions of labor, and women's activity in private spaces, women's demand for the right to occupy public spaces was both a denial of femininity, and a threat to the progress of civilization. If women of good breeding were not available for marriage with men of genius in order to produce genius in the next generation, then there would be regression to mediocrity, or reversion to primitive ancestral type. This house of cards was built on the assumption that femininity was 'real', that femininity was normally distributed in a population, and that the correlation between femininity and ovaries was therefore also as 'real' as it would be if one could prove that ovaries caused femininity. Strictly speaking this is not biological determinism, it is statistical determinism.

To see how the Galton-Pearson reorganization of statistical calculation and mathematical probability could limit women's solutions to Darwin's 'not man' conceptual category, we need to summarize the connections of Darwinian theory to the technologies of statistics and probability. Darwin proposed that the 'sex' of an individual body was established by primary sex characteristics (eg: genitalia), secondary sex characteristics (eg: facial hair), and tertiary sex characteristics generally perceived as masculinity and femininity (eg: passivity, intellect). Each of these levels of sex characteristics were connected to degrees of variation, reproductive advantage, and the advancement of civilization. Quetelet's statistical law of central tendency (average man), based on the curve of error and the law of large numbers, created the assumption that frequencies of all three levels of sex characteristics were normally distributed in a collectivity/population of men, or of women. Galton took this one step further by detaching the assumed regularity of frequencies from Quetelet's notion of many little causes, making the normal curve a causal law in itself with its own effects of correlation and regression (Gigerenzer et al, 1989). Means and dispersions within the three levels of sex characteristics could therefore be correlated with each other with no reference back to any determining factors among actual social collectives. One could predict that a primary sex characteristic would be correlated with secondary and tertiary sex characteristics. If these correlations fell within certain limits, particular sex characteristics were normal in that population (of men or women) by statistical law. The alternative explanations at the end of the nineteenth century for the stability of the link Darwin made between sex characteristics and body parts were: the nature of human nature in a lingering expectation theory, the divine plan, or Durkheim's cosmic forces acting on the collective (Hacking, 1990; Gigerenzer et al, 1989). Darwin had connected the concepts of masculine and feminine to bodies in theory; Galton and Pearson raised that to scientific fact. If women valorized feminine/female secondary and tertiary sex characteristics into a new concept of 'woman' as normal, the 'not man' category could be displaced from a negative value to a positive value. Conversely, if women internalized their oppositeness in the 'not man' conceptual category, they remained conceptually inferior and subordinate to men. And finally, if women resisted the notion of a conceptual space as 'not man', through a separatism into women only space, they were likely to be labeled deviant/abnormal. These three choices, modified by more sophisticated theory, continue to inform contemporary feminisms.

Based on the reorganization of mathematical probability, Galton, Spencer and Pearson developed the sciences of biometrics and eugenics, and the conceptual framework for a Social Darwinism. They determined that social undesirables tended to have more children, and therefore control of reproduction among these groups was both necessary and coherent with the Darwinian model of evolution (Shipman, 1994; Moscucci, 1991) Darwin was not convinced that eugenics was a useful or moral scientific endeavor because it ignored environmental factors, the cornerstone of his original theories. Lewontin (1984) points out that Darwin's fluctuations between biological necessity and environmental influences created the debate about nature versus nurture that continues to plague the human and social sciences.

The Darwinian conceptual revolution in natural science that historicized man, confirmed a forward motion in time associated with increased complexity, and separated male and female into opposite sexes. In combination with the conceptual reorganization of mathematical probability, Darwinism changed the content and direction of research on sex difference. The two sex model was stabilized. For the first time in a long history of subordinating the feminine/female to the masculine/male, the sex/sexuality of the body determined by body parts and functions, was directly associated with social characteristics and behaviors. It is at this point that we begin to see statistical differences in males, females and sexualities treated as if they were actual categorical differences (Gordon, 1991).

This methodological fallacy arose because social theorists using the techniques of mathematical probability could create human objects for research, where such objects had not previously existed in the everyday world (Danziger, 1990). One of the best examples of the artificial invention of a category out of research on sex difference, is the creation of the heterosexual. Procreative and non-procreative sex acts between men and women and the related issue of marriage had been the subject of discourses for thousands of years. Statistically male-female sex acts were common among humans, they definitely fell within the one standard deviation point in a normal distribution of human sexual activity. In post-Galton mathematical probability terms that made this activity 'normal'. However, it did not separate male-female sex acts that were procreative from those that were not non-procreative. By correlating males and females with procreative sexual activity, researchers found that some men and women, in and out of marriage, did participate in female-male non-procreative sexual activity. These activities were labeled heterosexual to distinguish them from both procreative sex, and same-sex acts/homosexual. Researchers now had a new human category to study; a category based only on statistical differences in sexual activity. As the word heterosexual entered into popular discourse the individual participating in this behavior gradually became the same thing as the abstract category. An individual or a group could now be identified with their sexuality through the use of statistics[20] (Katz, 1995, Mason, 1994). This is a vastly different process for making up people (Hacking, 1986) than what occurred with the development of social-sex categories such as independent virgin, or witch. Those categories were derived, rightly or wrongly, from observation of real people in real situations.

Of equal significance, it was now possible to predict how men and women might behave under specific conditions, or how specific conditions might change the relationship between men and women. Therefore it was possible to create conditions to enhance desirable behaviors, and control or prevent undesirable social phenomena. Feminist activism and the possibility of independent women making decisions about their own bodies, entering Universities and the labor force, critiquing men and male science, and demanding the privileges of democracy were not, from a masculine point of view, desirable phenomena. The new 'Woman' created by women's resistance to the sex-eugenics developed within Social Darwinism had to be controlled, the changes in the social dynamics between men and women prevented. Just as feminism had left the pages of books, anti-feminism now left behind literary debate and became an active force. The sciences of sex difference, biology, psychology and sociology, used the theories of Darwin and Spencer and the methodologies of Galton-Pearson to collect data, and mathematically predict the dire consequences of male-female equality, disruptions in concepts of masculinity and femininity, and any changes in divisions of labor or the separation of spheres of activity. Strategies ranged from demonizing the independent woman with the labels invert/lesbian or prostitute, imprisoning women who marched for the vote, to outlawing contraception, and refusing to grant degrees or acknowledge a woman's participation in scientific discoveries (cf. Bell & Offen, 1983). By the end of the nineteenth century the sexing and sexualizing of bodies and the processes of gendering were no longer an exclusively male enterprise. Women's solutions to the problem of harmonizing their rights of citizenship with the idea of perfectability and orderly social progress, whether through valorizing, internalizing or separating from male opinion, often had the effect of increasing the conceptual difference between masculine and feminine, male and female rather than liberating women from the oppressions of subordination to the male/masculine (Rosenberg, 1982). The greater the conceptual difference between women and men, the easier it was to create categories/variables to prove that difference.

In the opening paragraph for this Chapter, I used Thagard's (1992) definition of a conceptual revolution as the replacement of one complete system of thought with another; a replacement that has epistemological consequences. The Darwinian conceptual revolution in the natural sciences was not entirely responsible for the shift from a one sex model of gradations of 'man' to a two sex model of differentiation into 'man' and 'woman'. That shift began with the lifting of the prohibition on human postmortem dissection, and continued with the emergence of humanism, the reorganization of probability theory and the development of scientific methodologies. I am arguing that it was Darwin's historicizing of males and females into differentiated evolutionary paths, and his theories of sex selection that stabilized the two sex model and changed this model from complementary of the sexes into the concept of opposite sexes. The epistemological consequences of this aspect of the Darwinian conceptual revolution, as far reaching as they were, may not have had a lasting effect without the reorganization of mathematical probability that provided a means to ground the oppositeness/polarity of male, female, sexualities, masculinity and femininity in a scientific context. The question that we need to ask is how this epistemology of polarity outlasted the demise of sex selection theory. With the re-discovery of genetics and the discovery of hormones, the two sex model blurred again. In the next Chapter, I will enlarge on this point with an interpretation of the historical narrative that will analyze the present relationship between 'sex' and 'gender', by using the past to reveal the limits of these two concepts within contemporary feminist and sociological theory.

To summarize the historical narrative in a conceptual chronology, without creating an artificial periodization, I have completed sentences beginning with the words, being a woman ...

- Being a woman means being like Hera, Artemis, Aphrodite .....
- Being a woman means being feminine, masculine, or hermaphroditic
- Being a woman means lacking reason
- Being a woman means being cold and moist, soft flesh

- Being a woman means being a deformed male
- Being a woman means dangerous sexuality, an inferior body
- Being a woman is caused by femininity, by lacking reason
- Being a woman is caused by having a clitoris, an ovary, a uterus
- Being a woman is caused by fitting a true value
- Being a woman is caused by not being masculine/male
- Being a woman is caused by the correlation of femininity with femaleness
- Being a woman is caused by the virtues of femaleness/femininity
- Being a woman is caused by chromosomes, hormones
- Being a woman means thinking you are a woman; acting out femininity
- Being a woman _________________________?

NOTES

1. I have chosen to use Thagard's (1992) 'conceptual framework' rather than Foucault's (1970) 'episteme', or Kuhn's (1970) 'paradigm', because it more accurately describes what was occurring with the constructions of concepts (male, female, sexuality etc.), rather than describing fields within which knowledge was/is produced. All three theorists discuss the revolution in thinking occasioned by Darwin's work.

2. This remains so today, although generally unacknowledged. This becomes clear if you look at a topic such as reproductive technology that is studied from the perspectives of all of the social sciences, not just as a topic under the discipline of biology.

3. Social Darwinism is "the theory that 'social progress' and ethics derive naturally from principles of self-preservation, and the so called law of the 'survival of the fittest'." This theory is generally attributed to the social theorist Herbert Spencer, a contemporary of Darwin. See Atterton, 1994:16n.1. It was the Spencerian form of Social Darwinism that crossed the Atlantic and influenced the North American development of sociology and psychology. See Rosenberg, 1982.

4. Europeans first encountered the African and Asian apes in the seventeenth and eighteenth century, and anthropomorphized them with male and female characteristics and roles. See Schiebinger, 1993.

5. Reason was defined as the ability to transform nature through invention, i.e.: the ability to create culture, as well as the ability to think rationally. Steinbrugge, 1995;23.

6. The correct female body type was white skinned, with round, upright breasts, small or hidden clitoris, and labia that folded flat across the vulva; the correct male body type was white skinned, but no other body part criteria was used except brain size as an indicator of the capacity for reason. Schiebinger, 1993.

7. Georges Cuvier was a French anatomist, fossil expert and education reformer who after 1795 worked and studied

at the Museum of Natural History in Paris with Jean Lamarck, one of the early evolution theorists. See Funk and Wagnals, Encarta c. 1995, Microsoft.

8. This utopian tendency was present in the 'sex radicals' of the late eighteenth century who promoted their anti-marital version of free love in the context of the new democratic ideals of liberty and equality. This romantic tendency achieved a more practical level during the early decades of the nineteenth century with the theory and practice of the utopian socialist, and protofeminist followers of Saint-Simon, Fourier, and Owen. See Ty 1993; Moses & Rabine, 1993; Taylor, 1983.

9. Thomas Malthus, 1798, An Essay on the Principle of Population.

10. Thomas Hobbes, 1651, Leviathan.

11. The latter is particularly evident in the work of Saint-Simon, Fourier, and Owen. See Moses and Rabine, 1993; Taylor, 1983.

12. Along with the extended anatomical homologies came the resurrection of the theory of humors. Male periodic bleeding from nose, nipples or penis was attributed to the letting of excess moisture to maintain the hot/dry status of the male body. See Moscucci, 1991:178-180]. It was proposed that the hermaphrodite, rather than the male, might be the standard of human (Moscucci, 1991).

13. Ruth Kelso (1956) states that over the nearly 400 years of the Querelles, 251 books on the topic of woman were published; 90 male authored books against women, and 161 male or female authored books in favor of women. This does not include the uncountable number of manuscripts, trial records, political tracts, sermons, pamphlets, or purely 'scientific' anatomical-physiological and alchemical treatises. For additional information on the Querelles, see citations in the text, and McInnes, 1994; King, 1991; Faure, 1991.

14. The word feminist, although an anachronism, is being used to illustrate that the feminist texts of the Querelles written by women and some men supported arguments for change in women's position or value, while the anti-feminist texts were written by men, in order to justify, or demonstrate female inferiority and the need for maintenance of gendering.

15. As Wertheim (1995) demonstrates, the boundaries in question focused on the quasi-religious nature of early 'science' that emerged from the revival of the Pythagorean male-centered notion of 'the number is all'. Therefore women-doing-science did not include Physics, or the formal study of astronomy. Women were encouraged in the less mathematical study of plants and alchemy.

16. Mendel developed the theory of genetic inheritance, and published his monograph in 1866. There is evidence that Mendel sent Darwin a copy. Darwin either did not understand the significance, or chose along with the natural science community as a whole, to ignore this information (Lewontin, 1984). Mendelian genetics would not surface again until the early twentieth century.

17. Charles Darwin, 1874. The Descent of Man and Selection in Relation to Sex, second revised edition, Part 3, Chapter 19. Russett (1989) states that in the 1871 edition of Descent, the sex-selection theory took 202 pages to explain, in the 1874 edition this had increased to 410 pages.

18. John Stuart Mill, 1867, The Subjection of Women.

19. Bernoulli's theorem, see Hacking 1990; Daston, 1988:231.

20. The procreative and non-procreative activities between women and men blended with time into a single meaning for heterosexual. See Katz, 1995.

Chapter V: Many Sexes, Many Genders ?: Queer(y)ing The Narrative

> Isn't it amazing how patriarchal conservatism always manages to recreate the optimal conditions for its own survival (Braidotti, 1989)

The historical narrative presented above is of necessity, selective. Foucault's three volume *The History of Sexuality* (1986, 1990a, 1990b) published between 1978 and 1984 created a flood of social constructionist research on, theory about, and genealogies of power/knowledge in relation to sexual practices, sexed bodies and concepts like race, class and gender. The sheer volume of this material precludes an exhaustive search for, or evaluation of material relevant to this thesis. Much of the recent research relies on interpretations of translations, and/or the re-interpretation of former interpretations of historical documents and texts. Therefore scholarship in the areas of conceptual frameworks, knowledge production, epistemologies and methodologies is bound to be subjective, guided by both personal interest, and by current ideas about which concepts are problematic. Given this selective and subjective nature of an historical narrative, the interpretation and analysis that follows should be read within the context of the subject position of the narrator.[1]

In this chapter I will pull several threads from the weave of the narrative to situate the concept of gender within the long view of gendering as a process. This will be followed by an examination of the social-scientific construction of sexed and sexualized bodies in relation to gendering, and the concept of gender. The foundations for gendering, the division of humanity into categories corresponding to the cultural concepts of 'woman' and 'man' through the constructed social characteristics and behaviours of masculinity and femininity, have been a constant within the geopolitical frame of the historical narrative. Feminist and woman-centred social historians have shown that gendering as an active process was closely associated with, or a product of, male-defined, or patriarchal socio-economic, political and ethical systems or institutions (cf. Bridenthal & Koonz, 1977; Anderson & Zinsser, 1988; Lerner, 1993). Patriarchy is a convenient, but not entirely accurate descriptive devise for what was occurring in knowledge production after the seventeenth century, or after the revolutionary call for Liberty Equality and Fraternity (see Pateman, 1988). Once the vertical male dominated power relations of knowing through the authority of god(s) was reorganized into more horizontal fraternal networks of knowing through the authority of masculine reason, the concept of patriarchy no longer provides a conceptual framework broad enough for the study of gendering. To open a larger conceptual space, I am situating the idea of the constancy of gendering within the world view of cosmic-human harmony, that emerges continually within the narrative. Using this world view as a structuring system for conceptual frameworks captures both the patriarchal and fratriarchal relations of power that operate within knowledge production to produce truth claims, and to repress knowledges not in accord with those truth claims (Foucault, 1990a). The idea of harmony will be addressed in more detail below.

Gendering has structured knowledge as an epistemological framework, but was not itself a product of a specific knowledge enterprise until after the mid-twentieth century. 'Gender' has always been discursively present to structure social arrangements through the concepts of masculinity and femininity. But 'gender' could only be described through the effects of the gendering process (i.e.: women's lack of rights) until technologies were developed to measure masculinity and femininity, and thereby constitute these concepts as 'real' objects of study. The process of making the characteristics and behaviours that constitute the concepts of masculinity and femininity 'real' began with the reorganization of probability theory in the early nineteenth century. By the end of the nineteenth century an abstract characteristic like irrationality was assumed to have a normal distribution in a population of women, making this characteristic something 'real' that was attached to the average woman. Similarly behaviours like male initiation of procreative sex acts, or vaginal orgasm were assumed to be normally distributed in a population of married couples. A priori assumptions of this kind were a necessary foundation for the development of a concept of gender that assumes there is something objectively 'real' that can be labelled social performance, gender role, or 'core' gender identity.

The sexing, and sexualizing of bodies, the division of humanity by body parts and functions, has always been constituted within the specific conceptual frameworks of knowledge production. Therefore sexing and sexualizing reveal more discontinuity over time and place. As Laqueur (1990) emphasizes, in his explanation of the one sex/two sex conceptual models, there was never a time in Western cultures and their antecedents when people did not recognize structural differences between human males and females. Phallic and vulva symbols are present in the art and iconography of most ancient and modern cultures. What we need to recognize is that seeing difference in body forms and making that difference central to a social organization, do not become coherent until after the seventeenth century. As Jordan (1990) points out, anatomical distinctions in and of themselves were not particularly relevant as long as people believed that body distinctions were only related organically to procreation. This lack of direct relevance of sexed/sexualized bodies persisted for about 4700 years of our near 5000 years of recorded history. Social categorization was specific to gendering,[2] not to bodies; that is specific to the maintenance of cosmic-human harmony through the privileging of the masculine over the feminine in divisions of labour, and the separation of spheres of human activity.

What we see occurring over the time of the narrative is an increasing reliance on knowledge of the body to reinforce the meaning of masculine and feminine, and to justify social action that separated the female/woman from the male/man. Still, this conceptual division by bodies was only relative, within either a Christian reference to the imago dei or a humanist scientific claim to natural difference, as long as the one sex model persisted. The turn toward absolute difference that has provided a scientific basis for a two sex model began with human postmortem dissection in the early fourteenth century and reached its zenith in the nineteenth century concept of opposite 'sexes'. The history of sexing and sexualizing bodies during the twentieth century has been one of conflict between the absolute difference in male and female bodies inherited from the nineteenth century, and the emerging reality of relative difference between the female and male as knowledge of the human body has penetrated to the level of cell and gene (Hausman, 1995; Oudshoorn, 1994). The historical discontinuities within the one/two sex models, and in the degree of relative and absolute body difference, cannot be separated from changes in the conceptual frameworks within the more continuous world view of necessary cosmic-human harmony that structured gendering. Therefore the production of sexed and sexualized bodies cannot be separated from processes of gendering. Bodies were conceptually produced to match the prevailing ideas about masculinity and femininity and the divisions of labour and spheres of activity structured by those ideas. The interpretive analysis that follows will focus on the relations among an harmonic world view, the structuring of gendering/gender, and the active production of sexed and sexualized bodies.

Gendering

> ...the sexual division of labour is the basis of the di-vision of the world, the most solidly established collective - that is objective - illusion. (Pierre Bourdieu, 1990:146)

> Modern society, and modern conjugal society, had to be created, and they had to be created through organic solidarity ... (Lehmann, 1994:31)

The thesis framing this section is that gendering as a social process has remained a constant across the time period of the historical narrative. On the other hand gender as a concept, an abstract notion used to capture the effects of gendering, came into existence only in the mid 1950's, and was not widely used in social theory until the 1970's. Although the historical narrative cannot tell us much about the concept of gender prior to the mid-twentieth century, it can situate the concepts of masculine and feminine, and the social arrangements of gendering arising from those concepts, within conceptual frameworks that provided the conditions of possibility for the development of the concept of gender.

It is evident from the narrative that humans were being divided into social categories by characteristics and behaviours, that determined their place in social hierarchies as early as Hesiod's (750 BCE) suggestion that the male principle have power over the female principle. This type of hierarchical division has continued across time, still evident in the headlines of daily newspapers in European and Anglo based cultures. To understand the constancy of gendering we need to look beyond the localized effects of these divisions to a broader vision of the role of gendering in mediating the tension between order and chaos that structures a world view of cosmic-human harmony.[3]

Harmony represents order, an arrangement that can be expressed through either unity (sameness), or complementarity (qualified difference) at the level of the universe (spirit), or of the natural world (matter). In the cosmogonies, mythologies and rituals that structured the ancient world, the relationship between the universe and the human was one of intertextuality where the gods (goddesses) were as much men (women), as men were gods. Knowledge of human nature was constructed within the mirroring of the universe in human affairs.

The ascendancy of a multi-vocal (polytheistic) or singular (monotheistic) male skygod conceptually separated the natural earth bound world from the cosmic universe through the eschatology of mortality and immortality, and through the shattering of an original hermaphroditic masculine/feminine principle.[4] The idea that body (matter) was corrupted by death, was accompanied by a gradual conceptualization of a spirit that would live on uncorrupted through an association with the gods/god. The human search for immortality was one of the first manifestations of a search for harmony; a means to re-align spirit with matter through the ritualized re-enactment of birth and death[5] (Blundell, 1995; Angus, 1966).

Greco-Roman rituals also sought to re-establish the harmony of masculine/feminine through the re-enactment of origin myths that stressed an ultimate complementarity achieved through the act of procreation; acts of sacred sexuality (Angus, 1966). The Judeo-Christian rejection of the feminine in god and adoption of an origin myth that denigrated the feminine, meant the loss of a sacredness in sexuality, and a harsh enforcement of social arrangements directed toward privileging procreation, and male sexuality (cf. Highwater, 1990; Stone, 1976). Without a mythological-spiritual base the re-union of masculine and feminine principles tends toward constructed 'goddesses' (e.g.: Mary, female saints) and requires 'laws' of enforcement (e.g.: marital rules and prohibitions). The analysis of gendering, in the Christianized European context, must be situated in both the world view of a necessary cosmic-human harmony, and the conceptual frameworks structured by the tensions inherent in a an ethical system that by definition cannot incorporate the feminine. The conceptual re-organization that occurred around 600 BCE moved the search for harmony from the realm of myth and ritual to the realm of the natural world, while retaining the older myth-based ideas of masculine and feminine.

Beginning with the Pythagorean rationalization of the cosmos and life-world through numbers, reason was privileged over desire and superstition as a source of wisdom (Alic, 1986). Reason was constructed as the essence of human nature; an essence located in the masculine psyche/soul. The immateriality of numbers transcended matter and therefore represented a purity untainted by human affairs (Wertheim, 1995). By anthropomorphizing and gendering numbers, and arranging their qualities in a Table of Opposites, the Pythagorean vision of the universe could be translated back to human qualities and activity. Based upon such mathematical formulae, the Pythagoreans established the harmony of the cosmic bodies moving within their spheres around a central fire. Temporal harmony reflected cosmic harmony with the transcendent mathematical man as the central fire around which lesser males and chaste and obedient females revolved in segregated spheres of activity (Wertheim, 1995; Alic, 1986). Although women were a part of the Pythagorean community, the mathematical (rational) woman was an oxymoron because the feminine was associated numerically with matter, corruption and limitless chaos. To maintain temporal harmony a woman participating in mathematics had to leave behind the domestic sphere of the household and renounce the feminine through chastity; that is become man-like within a sphere of knowledge production based in masculine reason.

The ascendancy of accumulated masculine wisdom as a means to know and structure the world, provided a rational basis for the social, economic and political divisions of men and women. Hesiod could impose his misogynous view of a separation of earthly female from transcendent male god only within an irrational, single culture belief system. Xenophon, 300 years later was able to make that separation universal by reference to both nature and rational laws developed in the cultural context of developing knowledge (Blundell, 1995). Gendering humans by attributions of masculine and feminine characteristics and behaviours functioned to maintain harmony through two interrelated social arrangements. The first, a division of labour addressed the activity of men and women, from the manner in which their bodies were used in sexual practices, to the simple use of appropriate tools, and the more complicated relations of men and women to the means of producing subsistence or culture (Illich, 1982). The second, a division into public and private spheres[6] addressed where that activity could take place, or carried authority (Fraisse, 1994, Coole, 1988).

In terms of authority, the roles of human actors within these divisions have been structured as mutual, that is complementary, but seldom reciprocal (Jordan, 1990). Just as cosmic bodies were asymmetrical in size and astrological importance, but did not arbitrarily govern their own harmonious arrangement in the universe, human bodies as elements in the natural world were asymmetrical in authority and governed by similar laws of complementarity. The idea of masculine over feminine, as a mirror of sun over moon, planets over stars, god over human, spirit over matter, was generally structured so that some men had authority over males and all adult females in the public sphere, while women had authority over children and other females in the private sphere, but no authority over adult men in any activity, public or private. Authority rested in the specific traits attributed as masculine or feminine, not in the body of the person. Therefore it was possible for some women to renounce the feminine and act and/or speak in public spaces. We see evidence of this within the historical narrative with the independent virgins, Hypatia, and Catherine of Alexandria in the early Christian period, and Christine de Pisan and Jeanne d'Arc in the fifteenth century.

When these social arrangements, and levels of authority are viewed as a means to ensure harmony at the level of human activity that mirrored prevailing knowledge of the harmonious arrangement of the universe, it becomes clear that masculine/feminine divisions of labour, and separate spheres were perceived as an agreement among material parts at the human and cosmic levels. What is more difficult for the modern mind to grasp is that the harmonic, or complementary, arrangements among humans were not dependent on bodies or body parts. The original thought sequencing behind these social arrangements can only be guessed at, but I would argue that the foundations for these arrangements followed the ancient pattern of myth and ritual as follows. Particular human characteristics and behaviours were constituted as masculine, feminine or hermaphroditic gods and goddesses; for example Hera (female) the 'feminine' nagging wife and protector of the hearth, Artemis (female) the 'masculine' protector of young girls and wild animals (Blundell, 1995). The traits of these gods/goddesses became principles, or types, that moved from the specific hierarchical position of the characteristic to the particular type of person (or god/goddess) occupying that position. Thus traits such as heroic, virtuous, rational or just were associated with what was required to participate in ritual leadership, development of wisdom, battle, governance, and trade; that is events that occurred outside of the household in the space where a culture different than the domestic was created. Once the sky-god, and therefore the human male, was perceived as the powerful actor in the creation of this public culture, those traits considered important for activity outside of the domestic, were ascribed to the manly/masculine person. As illustrated above, it was probably common, but not entirely necessary for that masculine person to also be an anatomical male (Blundell, 1995; Winkler, 1990; Highwater, 1990).

The shifting of characteristics across bodies, evident in the legends of the Amazons, Hesiod's Theogony, and Homer's heroic tales (Blundell, 1995), reveals that it was the trait, not the body, that structured divisions of labour, and divisions of activity into public or private. Acting out these myths and legends in rituals within cults and mystery religions would only be effective in constructing and maintaining specific genderings in small, stable, and somewhat isolated cultures. The conflict between those who sought to legitimize genderings as a form of cultural harmony, and those who resisted, is also captured in myth through the characteristics and behaviours ascribed to hermaphroditic god/goddesses/persons (Delcourt, 1961). As Joseph Campbell (1988) has emphasized, myth has enormous power because myths contain an element of reality that people can relate to their daily lives. However myths require authority, or they become merely story telling. Ritual enactment can fail to ensure harmony, if conflicting ideas, or cultural diversity, undermine the balance between myth and reality. To maintain the hierarchy of masculine and feminine characteristics and behaviours within a more rational world view, these characteristics and behaviours were integrated into authority structures through masculinized knowledge, prohibitions, taboos, codes of conduct, and codified laws (Blundell, 1995). Without resorting to the notion of archetypes it is possible to project the power of myth into the shaping of new conceptual frameworks. Myth based masculine, feminine and hermaphroditic traits and behaviours and the social arrangements of gendering structured by them in the Greco Roman world, were absorbed into Christianized doctrine and knowledge producing institutions, because gendering was one way to establish, and maintain a harmony that was essential to Greco-Roman and Judeo-Christian belief systems (Angus, 1966)

The point of this suggested sequence of thought is not to create a truth about origins, but rather to examine the conditions of possibility for the beginnings of a relationship between a world view (harmony) and social arrangements (gendering) that has persisted across enormous differences in location, time, and techniques of knowledge production. Gordon (1991) outlines the influence of the metaphysics of harmony on social theory after the seventeenth century. Ian Hacking (1990) complements both Wertheim's (1995) analysis of the importance of harmony in the development of science, and Gordon's (1991) analysis of harmony in regard to the development of the social sciences, in his exploration of nineteenth century probability theory and methodologies as a means to 'tame chance' and re-establish a basis for an harmonic social order. Comte's positivism, and Durkheim's organic solidarity are also examples of this search for harmony (Lehmann, 1994). We can see contemporary examples in the search for unified theory in Physics (Wertheim 1995), the search for a single answer to the origins of life in the Human Genome Project (Rose, 1994), in notions such as 'global village' and 'family values', and in the resistance to 'postmodern' relativism in sociological theory (Seidman & Wagner, 1992).

While it is possible to argue for a one-to-one coherence between Greco-Roman and early Judeo-Christian cosmic-human harmony and the processes of gendering based on the similarity of teleological belief systems, this argument becomes more complicated with the emergence of humanism and the scientific method. If the conceptual framework of cosmic-human harmony was associated with the superstition of ancient beliefs, then the resurgence of a rational, man-centred world view during the Renaissance and the Enlightenment should have set aside the search for a harmony between the cosmos and human affairs, and in doing so, released humans from any necessity to pattern their characteristics and behaviours on either cosmic myth or the arrangements of the universe. Following the logic of a re-ascendancy of reason over superstition, un-reasonable ascriptions of masculine and feminine, and the social arrangements of gendering should have disappeared. The outline of the issues debated during the Querelles des femmes (Chapter Four); a debate that parallels the period of the development of science, reveals that this did not occur. The concepts of masculine and feminine, and the divisions of labour and separate spheres structured by those concepts, continued to be used to structure contemporary Western cultures. There are several reasons for this. I will introduce and discuss the relevance of the sexing and sexualizing of bodies to the constancy of gendering, in the next section. Bracketing the body for now, we need to continue examining the concept of harmony in another dimension, and then relate this to events and ideas in the second and third parts of the historical narrative (Chapter III and IV).

The soul has generally been ignored in social theories not directly related to religion, and is only strongly evident in theoretical work on gender within feminist theology and women's spirituality. The soul cannot be dismissed as superstition in cultures and societies built on ancient Greek ideals and philosophies, and infused with Christian eschatological doctrine and ritual. Conceptualizations of the soul were a part of gendering, whether that was the polarity of a Platonic vision, or the unity suggested in Augustinian theology (see Chapter II). The soul, expressed as spirit, conscience, predestination, the unconscious, memory, or more currently in Physics and Biomedicine as the mind/face of god,[7] mediates human-cosmic harmony through realignments of mortality and immortality, and works to reinforce the attribution of masculine and feminine characteristics and behaviours, and therefore divisions of labour and separate spheres. The continuing presence of the concept of soul is a social fact that requires a social explanation; an explanation that may reveal an unexplored dimension in the processes of gendering.

We can use the timeless concept of soul to examine what occurred during the period of the emergence of science. As Margaret Wertheim (1995), David Noble (1992) and Carolyn Merchant (1983) illustrate, the conceptual reorganization of knowledge production in the humanist project to know the natural world through reason, has never completely rejected the notion of god. The scientific enterprise emerged from the religious and quasi-religious contexts of male dominated craft guilds, and male homosocial monasteries where the early sciences of astronomy and alchemy were strongly associated with the ancient Pythagorean harmonious conjunction of body, soul, mind and universe (Noble, 1992). Both the universities and the academies, as institutions of knowledge production, were structured by Christian men of god who saw nature-as-feminine as a potential source of chaos unless contained within the complementarity of procreation. The feminine spirit or soul resided in an hermaphroditic notion of the human mind, the feminine body homologous with the masculine body resided in the natural world. To discover the secrets of harmony in the natural world (earth and cosmos), that is within public space but without reference to a divine plan, the rational masculine had to be separated from the irrational feminine in soul (alchemy), mind (philosophy) and body (anatomy).

The separation of masculine from feminine at the conceptual level justified the continued exclusion of women from institutions of learning, and provided a new rationale for using masculine/feminine characteristics and behaviours to enforce divisions of labour, and separate spheres of activity. At the level of human activity, the Protestant notion of predestination broke apart the Augustinian unity of souls in god. Each man and woman was required to maintain his or her place within masculine defined social structures or risk losing their assumed state of grace. The rise of capitalist economies gradually disrupted the complementarity of labour by separating household and workplace, creating new ways of dividing labour, and assigning separate spheres. At the cosmic level the Newtonian reorganization of the heliocentric universe as atomistic, and governed by gravitational laws, reinforced the commercially driven perception of nature as machine, further rationalizing and thus masculinizing the natural world. The inclusive affinity of all nature with the feminine was reduced to the affinity of the feminine with religious practice, procreation, love, family and household; the domestic/private sphere. The harmony of the Newtonian mechanistic cosmos was mirrored by an atomized mechanistic harmony in masculine and feminine divisions and spheres of human activity. The mathematical laws that governed a static equilibrium in the universe, were translated back into social laws with the intent of establishing a similar harmonic equilibrium in human affairs. The processes of gendering survived the conceptual reorganization of the Scientific Revolution because as Noble (1992) and Prigogine and Stengers (1984) illustrate, the dominant man-centred paradigms of science that replaced the divine plan, were equally determined by the timelessness of the conceptual framework of cosmic-human harmony.

The historical narrative points to the 1790's as a period of social upheaval that introduced a debate about who was to be included in the notions of liberty, equality and fraternity, and who would have the power to re-structure the social arrangements affected by these new ideas. The Newtonian paradigm of mechanical forces holding the universe in stable equilibriums with its complementary Cartesian notion of the natural world as a gigantic system of interrelated gear-like parts, dominated knowledge production systems with assumptions of natural order hidden beneath apparent chaos (Toffler, 1984). Theories of the social world that began to emerge during the eighteenth century emulated the rational mechanistic world view and methodologies of Newtonian Physics, or reacted against rationalism by emulating Romanticist notions of quality and creativity in relationships among humans, and between humans and nature. While the outcomes of change, were not yet an issue in Physics or natural-medical science, they were very much an issue in social theory from both the mechanistic and the Romanticist perspectives. It is not surprising then, as we saw in the narrative, that the methodologies of statistics and probability continued to develop within an emerging science of society. Time was to become an issue across scientific disciplines during the nineteenth century, as Physics confronted the challenge of the laws of thermodynamics and entropy, medicine took on the challenge of hygiene and prevention, psychology debated the associationist versus experimental method, and natural science absorbed the evolution theories of Darwin (Danziger, 1990; Hacking, 1990; Prigogine & Stengers, 1984). Gauss' frequency distribution curve, Poisson's law of large numbers, and Quetelet's 'average man', became effective tools for predicting outcomes across science, through what Danziger (1990) calls the 'triumph of the aggregate'. To situate gendering within the conceptual reorganizations and revolutions occurring during the nineteenth century, we need to look at the clash of ideas about time, and at statistical methodologies.

The theory of propagation of heat developed in 1811 was the first challenge to the Newtonian paradigm of stable equilibriums, and reversible time in nature.[8] The two laws of thermodynamics developed during the nineteenth century provided frameworks for social theory, and theories of living organisms. The first law (1847), that energy is conserved (nothing is lost), even as it is transformed, created a conceptualization of society as well as its individual members as energy transforming machines (Prigogine & Stengers, 1984). This law complemented Cuvier's anatomical systems theory and thus indirectly influenced Darwin's theory of evolutionary processes. The second law (1852) introduced concepts that would contradict the Darwinian idea of time, and dislodge the dominance of a Newtonian concept of reversible time. Briefly, the second law attempted to account for the fact that once the fuel that produces energy is burned it disappears forever, energy dissipates over time. At the cosmological level this led to the idea that the energy required to stabilize the universe was being used up. Therefore the universe would reach a point of rest and using Newtonian laws, succumb to the forces of gravitation and collapse into chaos, rather than return to an initial condition. Time was therefore irreversible and governed by entropy, the tendency toward increasing disorder (Grosz, 1995). Darwinian evolution on the other hand posited the same irreversibility of time, with the opposite outcome. Time was moving forward into increasing order through the increased complexity of living organisms. In either case, the ability to predict outcomes was essential to re-establish harmony, at least theoretically, at the cosmic and human levels. Both heat Physicists and evolution theorists turned to mathematical probability (Prigogine & Stengers, 1984).

There are two things to note in regard to gendering. The Newtonian paradigm of time as reversible held science in the grip of its conceptual framework, and this extended into the social through popularizations of science in the eighteenth century (Toffler, 1984). The notion of reversible time can, in part add to the explanation of the persistence of processes of gendering through the period of the emergence of science. If we move to the abstract and see gendering as a constant object (like a rubber ball as a collection of masculine/feminine characteristics, and process of divisions of labour and spheres of activity) falling through time pulled by gravitational forces of social, economic, political and ethical systems, then we can also visualize the effect of that object meeting the resistance of events that displaced, or disordered gendering; women's leadership in early Christianity, or women's resistance revealed in the Querelles des femmes for example. The hard surface of disorder would cause the object to move backwards in time until it reached its initial condition; back to the mythological notion of particular masculine/feminine characteristics determining social location and spheres of activity as I described it above. What I am suggesting here is that within the Enlightenment view of "history as reason's advance against superstition" (Nicholson, 1994:83), gendering remained un-reasonable, locked into reference to a superstitious authority, as long as there was a perception of timelessness.[9]

The introduction of the idea of entropy and irreversible time coincided with the end of a literary debate over gendering and the movement of women into active resistance against the processes of gendering. Women's activism also coincided with the use of probability methodologies to predict outcomes of either the tendency to move toward increasing disorder, or increasing order. As Prigogine and Stengers (1986) express it, an arrow of time entered the conceptual frameworks of science, and that arrow pointed resolutely forward. Classical science, like the divine plan framework that preceded it, could not adequately explain a natural, human or cosmic world that was now perceived as continuously fluctuating between conservation and dissipation, order and chaos (Prigogine & Stengers, 1984). Harmonic order was no longer a matter of faith in god, or in the equilibrium of forces that governed a stable universe. And within this conceptual reorganization, gendering was no longer a matter of eternal reference to mythological beginnings. To reestablish a sense of cosmic-human harmony the sciences turned to the methodologies of prediction, seeking a way to sight along that forward pointing arrow and either forestall disharmony, or call harmony into existence by creating the conditions for it (Hacking, 1990).

In Chapter Four, I described the connection between the development of statistics, probability methodologies and theories of evolution. The intellectual, or theoretical, foundations for the modern concept of gender were established in the late nineteenth century, specifically within Social Darwinism and eugenics. This is not a particularly new insight within feminist theory, although its relevance for general social theory has largely been missed (cf. Hubbard, 1979; Sayers, 1982, Birke, 1986; Rose, 1994). Three factors have been missing from evaluations of the role of Social Darwinism in gendering/gender; first, the conceptual frameworks that provided the conditions for the metaphysical concepts masculine and feminine to become real objects of scientific study; second the importance of mathematical probability in constructing these concepts as objects; and third the importance of the notion of 'normal' in the larger conceptual project of maintaining a cosmic-human harmony. This section has addressed the first factor. We need to turn now to the sexing and sexualizing of the body in order to understand the role of the body in the maintenance of gendering, and the essential role of an embodied 'normal' in the invention of the concept of gender.

Embodiments

> Sex can be discussed in the unambiguous language of science. Gender bespeaks a complementarity that is enigmatic (Illich, 1982:4)

In the last section I discussed the processes of gendering as masculinized/feminized divisions of labour, and/or separations of spheres of activity. These processes remain abstract without reference to the kinds of bodies that act within the divisions, or occupy the appropriate spaces. Anthropological, Archaeological, and Historical discoveries and theories have localized and historicized the embodied reality of the enforcement of divisions of human labour, and the public/private over time. Sociological studies have tied these enforcements to social, economic and political factors. The historical narrative contained within Chapters Two to Four largely brackets this scholarship in order to focus on how the body was produced within conceptual frameworks for knowledge production. My aim in this section is to incorporate the sexing and sexualizing of bodies into the concepts and the process of gendering. The thesis framing this section is that there is not, nor has there ever been, an essential body. Male and female dimorphism is somewhat relative. Therefore creating two sexes in opposition to each other was convenient, and fit well with the need to continue a social separation of men and women that had been long established through the concepts of masculine and feminine.

Initially gendering did not require a specific body. Although the coherence between masculine and male, feminine and female was common within mythological symbolic and ritual systems, it was not necessary. The rationalization of the natural world, beginning about 600 BCE, marks the point where the body begins to matter. Because much of the production of sexed and sexualized bodies is fairly self-evident within the historical narrative, I will not repeat the details. Rather, I want to examine conceptual frameworks for points of agreement, conflict, or divergence between the production of bodies and what I have proposed as the rationale for, and processes of, gendering. References will be made to present time, the contemporary concept of gender and its relationship to 'sex' within social theory.

In Chapter Two the beginnings of sexing and sexualizing bodies within the Greco-Roman, and early Judeo-Christian frameworks, were presented in detail to demonstrate that the foundations for a division of humans by body structure, and body parts are deeply rooted within conceptual systems that still frame our thinking about the body. Echos of Hippocratic notions and Aristotelian-Galenic thought still resonate through bio-medicine, and current debates about sex and sexuality. The one sex model, a model that does not have to pay much attention to the body, is latent within contemporary creationist beliefs, and structures much of Judaic, Christian and Islamic fundamentalist rhetoric. Within those rhetorics sexuality is often the code word for the body, neatly avoiding discussion of what male and female bodies are, by focusing on what those bodies ought to be doing. The separation of the biological (sex) from the social (gender) in sociology during the 1970's meant that sexed bodies could be dismissed as something of concern only to bio-medicine, and sexuality could be nicely contained within studies of deviance, the family or gender.

When the body surfaced in the mid 1980's, as Foucault, Continental philosophies and French feminism became fashionable in academe, there was very little in traditional social theory that could respond to the demand for theory directly related to the historical construction of sexed and sexualized bodies. Part of the reason for this gap is that the two sex/two gender model that is being challenged by recent scholarship, was created within social science/sociology as it developed during the nineteenth century. To address the body, sociology must first address its own complicity in constructing that body. In current collections of essays that pit 'postmodern' social theory against more 'traditional' forms of social theory (Dickens and

Fontana, 1994; Seidman, 1994; Seidman & Wagner, 1992), the postmodernists tend to actualize an abstract body in the construction of theory, while the defense against postmodernism reverts to the virtues of the universal, the statistical and the objective, never addressing head-on the issue of humans-in-nature, or the embodiedness of social actors. The discussion that follows will concentrate on these two aspects of the sexing and sexualizing of bodies; 'sex' as nature, and the technologies of disembodying 'gender'.

Judith Butler (1993:5) goes to the heart of my argument by linking the history of the concept of 'sex' to the history of the concept of 'nature'. It is from within the natural world that the human body emerges as an object of study. From Aristotle through to Darwin, ideas about the human body were based on the observation of animals, and/or the difference versus similarity of human and animal bodies. A total focus on the human body without reference to the rest of the natural world did not occur until the attributes of the body became categories or variables within statistical determinisms. By the end of the nineteenth century statistical law had replaced natural law, detaching 'sex' from 'nature'. Freud, in turn, detached 'sexuality' from 'nature' by locating the constitution of desire in the psyche/mind (Freud, 1974). It was not until the invention of the concept of gender as a way of differentiating the social-cultural from the biological, that sex/body = nature re-entered the conceptual framework of sex-difference. The move to re-incorporate nature became problematic in two ways. First this re-incorporation tended to negate the sex=nature connection as the wrong headed essentialisms of masculine bias. This move was useful for social/feminist theorists to uncover the masculine construction of the female body as other than, or inferior to, the male body. However, the too ready dismissal of biological knowledge glossed over the changes in bio-medical knowledge of sexed bodies that are important for actual revisions of concepts of sex and sexuality. Second, since the 1970's the animal-to-human connection reincarnated sex selection theory in the more sophisticated form of sociobiology (Lewontin, 1984). The problem in the first case is that glossing biology leaves a large gap in sociological knowledge; abstracting social actors into institutions and structures in a way that prevents the naming of the agents who do the sexing and sexualizing of bodies, and quantitatively fixing social actors into dichotomies of men/women, white/black, normal/deviant and so on. In the second case sociobiology, and its close relative scientific creationism, over emphasize animal-human connections, reducing social actors to pawns of nature, or the products of a modernized divine plan. The paradox in both cases is that in re-incorporating nature, the conceptual sexing and sexualizing of the body, was left unacknowledged, and undertheorized.

The human body was divided into sexes and sexualities through the technologies of knowledge production within elite male homosocial learning communities, based on the superiority of masculine reason.[10] Men constructed their own bodies as the model for humanity, the female body as 'other', softer, weaker, deformed, tainted, perverse, and irrational. Male sexuality was privileged in procreative and non-procreative sexual behaviours, female sexuality was denied, made perverse, or held responsible for the failure of men to control their own body parts. The technologies for these hierarchical divisions varied over time from anatomical studies within natural science and medicine to philosophical conjecture, and the development of natural laws, and statistics. As the technologies varied, the actual lines of division between the male and female varied from whole bodies, to body parts, from anatomy/physiology to sexuality, from body to mind. This leads to a conclusion that there was no essential male or female body throughout the period of the historical narrative.

A careful reading of the historical narrative shows that there is a parallel movement between the masculinization of nature, and the separation of the body into two distinct and unequal sexes. Men masculinized nature, constituting the material of nature as public space to be dominated and converted to culture and economic advantage. Conceptually this had two results, the feminine, removed from nature, was reduced to private space, and the female body[11] as part of the material of nature, was a 'thing' to be converted to culture and economic advantage. Rousseau's treatise on education is a good example of this kind of conceptualization; natural man needs to be educated to enhance what he already has, natural woman requires education to transform her into culture so that she will provide the conditions of advantage for cultured man. As long as the female body was homologous with the male body, this kind conceptualizing was impossible. Anatomical science, using the technologies of post-mortem dissection, and the post-Bacon scientific method of observation and experiment constructed a body-sex difference that undermined the Cartesian notion of 'the mind has no sex', and reinforced the social divisions based on the concepts of masculinity and femininity. The revolutionary aspect of Darwinism was that it brought the concepts of masculinity and femininity, and the concepts of male and female into alignment so that gendering and sexing/sexualizing were contained within one knowledge production system.

I am suggesting that pre-Darwin, the sexing and sexualizing of bodies was incidental to gendering, acting as a prop for gendering at times when resistance to divisions of labour and separation of spheres of activity was relatively high. Augustine's revisions of sex within theological doctrine and practice coincided with the anxiety about the public activity of the independent virgins, the thirteenth century compromise on positions regarding sexed/sexualized bodies was concurrent with the shift in the Inquisition's attention to unruly women, and the emphasis on skull/brain size sex differences coincided with the re-surgence of privileging of masculine reason that removed women from direct involvement in science. The combination of Darwin's theories, and the technologies of statistics and probability mystified the role of sexing and sexualizing bodies in the maintenance of gendering by reducing gendering to the sexing/sexualizing of bodies. It was then possible to conceptualize the sexed body as foundational for gendering, tying the two concepts together. The conceptual practice of sexing and sexualizing the body within a conceptual framework of gendering was reversed so that the practice of gendering now occurred within a conceptual framework of sex. Sexed bodies were no longer incidental to gendering; being male or female now determined the gendering process. It is no coincidence that this reversal and the creation of a 'natural' foundation for gendering, occurred during the period when women stopped debating the issues in print, and moved into public space to demand both concrete change in the representation of their bodies, and their rights to social, political and economic equality.

Presenting the parallel histories of 'nature' and 'sex' in this manner has a tendency to read like a conspiracy theory, which, given the different cultural imperatives at different times and places, would be highly unlikely. What is being demonstrated here is what I call Phallic Drift,[12] the constant push of conceptual systems and knowledge production toward the privileging of a male/masculine position, in spite of, or perhaps because of, feminine/female resistance. Zeitlin (1982) provides an explanation of the 'resistance' effect of phallic drift in her work on women's participation in Dionysian cult ritual in classical Athens. The Dionysian ritual was a ritual of inversion (transgression) of the accepted views on women's nature. For up to ten days each year women abandoned home and family, took part in acts of aggression, and visibly displayed antagonism toward male defined sexuality. I want to make a conceptual leap here and connect this ritual to other instances of inversion/transgression within the historical narrative; independent virgins, the public voice of Christine de Pizan, women's use of the Cartesian 'mind has no sex' to enter into scientific discourse, public activism in the nineteenth century, and so on. As with the Dionysian ritual, these instances of inversion may have provided women with a temporary, or surface, increase in freedom and opportunity. But this generally involved a small group of women, or could be construed as a small percentage of the female population. The inversion/transgression provided the state, or ant-feminists, with concrete examples of women's essential disorder and lack of control. Therefore the inversion/transgression served to support the concepts and ideas that it was subverting by giving the state/anti-feminists the material for cautionary tales used to contain the majority of women within divisions of labour and separate spheres to the extent deemed necessary at any point in time. If we try to describe this phenomenon as patriarchal reversals, we miss the larger context. Women as well as men were/are participating in phallic drift. Resistance by inversion will always circle back and become a tool of oppression, because the concepts being inverted are the oppressor's tools (cf. Lorde, 1984:110). To break out of that circle, and reverse phallic drift, the concepts created by reasonable men that structure oppressions, need to be de-legitimized, not simply inverted. Inverting the female/feminine sexed body from a site of inscription and control, to a site of transgression may offer individual female bodies more freedom and opportunity, but in the act of taking that freedom confirm the original construction of the female body as unruly/abnormal. This in turn serves to contain the collectivity of female bodies within legitimate social arrangements by setting up a normal/abnormal dichotomy. In other words, some women gain temporary emancipation from femaleness, but the majority of women do not.

Phallic drift directed both gendering and sexing/sexualizing toward cosmic-human harmony; maintaining a constancy of gendering that from time to time needed confirmation by the sexed division of bodies. The point that needs to be clear is that although from our own perspective anatomical/physiological discoveries were pushing back the veil of ignorance about the body, this 'progress' in knowledge was not purely a matter of improved science. The historical narrative clearly indicates that, within varying meaning systems, the discoveries about the body were not value free. A phallic drift within natural-medical science often twisted observation to match either masculine conjecture, or male-privileged social arrangements. By the end of the nineteenth century specific technologies for sexing and sexualizing bodies were subsumed within the methodologies that constructed the new concept of 'normal'; the concept that replaced the older notion of human nature (Hacking 1990).

Normal derives from the Latin 'norma' meaning a T-square. Prior to the nineteenth century, normal was a geometry term meaning right angle, or a physiological term for organs not affected by disease. It is within the latter definition that normal was first paired with 'pathological'. Normal first became a concept in social theory in 1828 when it was used to describe a typical group. By 1840 the concept of normal was used to mean 'conforming' or 'common type'. In 1894 Karl Pearson described the Gaussian curve of error as the normal probability curve (Hacking, 1990; OED, 1989). In the development of a science of society the idea of pathology, borrowed from medicine, was used to describe undesirable variations in social phenomena such as suicide and crime. Comae focused on these variations as social illnesses that deviated from a normal state of social health. As he developed his ideas for a positive (moral) social science, normal came to mean good, something to be strived for; an ethical concept (Hacking, 1990:168). For Quetelet normal was the central tendency in a frequency distribution, the average or 'average man'. At mid-century, normal had become a complex concept used to describe what was conforming/common, containing within it the sense of goodness and health. The concept of normal was paired with the concept of 'abnormal'; deviant, unhealthy, pathological. Social and/or individual characteristics and behaviours that conformed to a socially determined central tendency were 'normal', those that deviated were 'abnormal'. Durkheim, following Comae used this meaning within his quantitative sociology (Hacking, 1990).

Galton created a subtle shift in meaning. He considered normal as that which "was characterized by the normal curve; the abnormal was what strongly deviated from its mean" (Hacking, 1990:178). Galton made prior assumptions about characteristics and behaviours being normally distributed. One did not have to measure anything to know that the urge to mother, derived from the fact that the female had ovaries, was normally distributed among a population of females. Therefore that urge to mother was characterized by a normal curve, and construed as normal. For Galton the mean, as central tendency, was not average, it was mediocre. The abnormal became the exceptional, a standard for what individuals or society should be or become, calculated as probabilities. Within quantitative sociology(s), the Comae-Durkheim use of normal was the basis for positivism and functionalism, while the Galton-Pearson usage of normal structured Social Darwinism and eugenics. These useages of the concept of normal blended with time.

The nineteenth century transformations of the concept of normal created the technology of standards for sexed and sexualized bodies, expressed in the concepts of 'man' and 'woman'. In general the seventeenth and eighteenth century body was conceptually sexed as female because specific body parts were named as essences of femininity within the notion of human nature. Femininity was the structuring concept, not femaleness. Darwin's sex-selection theory, and theory of the origins of sexual difference reduced femininity to femaleness by the blurring of any distinction among primary, secondary and tertiary sex characteristics. The ovary-uterus-menstruation (female), and passivity or nurturing (feminine) were all incorporated into a conceptual category of 'not man' that included women, and all other human types that were not described by testes-penis-facial hair (male) and aggression or intellect (masculine). The characteristics and behaviours of femininity and masculinity that Darwin chose as tertiary sex characteristics had already been established in mythology, theology and technologies like the probability of expectation. Tertiary sex characteristics were common features of 'human nature' within his society, where people conformed through convention, codes of conduct and law. Body parts, systems and functions were already essences of femininity and masculinity, having been so described by eighteenth century anatomists, and physicians. Such essences were also common, and most people were assumed to conform to either essential maleness, or femaleness. The essential/common sexuality, within Christianized thought was by convention procreative; heterosexual. Darwin proposed his theories from within the conceptual framework of 'normal', collecting physical essences and social conventions into one conceptual framework, and inverting the social-to-physical relationship between bodies and characteristics/behaviours to the physical-to-social. I have already addressed the issue of women converting the 'not man' category into a positive category of 'woman'. The statistical and probability technologies applied to the sexing and sexualizing of bodies, developed in the

Galton-Pearson or the Comae-Durkheim methodologies during the last quarter of the nineteenth century, took Darwin's theories from conjecture to fact, through the actual (determined) or assumed (autonomous) normal distribution curve. The 'normal' woman, or man, was, from this point on, a mathematically calculated oppositional category that could be given one of two numerical values, and serve as the variable 'sex' in social sciences research. The concept/variable 'sex' included within it both femininity/masculinity and femaleness/maleness, regardless of how these concepts were defined, or how well these concepts related to actual living beings (cf: Smith, 1990, 37-51).

The question posed in the last chapter was, why 'opposite sexes' outlived the demise of sex-selection theory when the relativity of maleness/masculinity and femaleness/femininity re-emerged in psychoanalysis (Freud, 1974), genetics (Rose, 1994), hormone theory (Oudshoorn, 1994) psychology (Lewin, 1984),[13] and cross cultural studies (Mead, 1963). I am arguing that the construction of the concept of 'normal', with its moral overtones and association with probability (i.e.: predictability) had so deeply invaded the bio-sciences, and been found so useful in the social sciences, that new knowledge about the sexed/sexualized body could be discounted as 'abnormal'. In other words the two sex model, now conceptually constructed as both natural and normal, became a convenient myth for social theory. Man and woman, as opposites within that two sex model, provided convenient categories or variables, for both statistics and mathematical probability methodologies. The relationship between sexed/sexualized bodies and gendering, not historically a strong relationship, was obscured completely within terms like sex-role, and sex identity; appearing to embody gendering by assuming a predictable one-on-one relationship between a body and characteristics and behaviours.

The invention of the concept of gender in the 1950's and 1960's (Chapter One) dis-embodied gendering, not by taking it back to a pre-Darwin loose relationship with sex, but rather by grounding gendering on sex, thus re-inventing the Darwin-Galton theoretical framework with some adjustments via Freud. The now taken for granted normally sexed and sexualized body slipped out of conceptualizations of cosmic-human harmony that were once again totally dependent on the complementarity between masculinity (man) and femininity (woman), and between man and woman and procreative sexuality. At the root of the invention of the concept of gender was the necessity of creating harmony (normality) between a sexed body and a sexuality, and between the sexed and sexualized body and a social performance, whether that involved the homosexual, the transsexual or the intersexed. Given the lack of comfortable space for gays/lesbians, transsexuals, or the intersexed, as subjects or objects, within either social or feminist theory, it is ironic that the movement to disrupt the concepts of 'sex' and 'gender' has come largely from those 'queers' querying that lack of space.

How Many is Enough?

In a 1993 edition of *The Sciences*, Anne Fausto-Sterling states, "Western culture is deeply committed to the idea that there are only two sexes. Even language refuses other possibilities... " (1993:20). Bio-science has known since the 1920's that there was no 'normal' genetically sexed body, only types that were more or less common. The total population could not be tested for correlations between an XX or an XY chromosome and development of 'femaleness' or 'maleness' (however defined). Structured by statistical law, the conclusion was reached that a sample represented the whole, and so what was common was also 'normal' within the population in general (Lewontin, 1984, 1991; Hubbard and Wald, 1993). Male and female 'sexes' were thus genetically determined, ignoring the fact that there were other combinations of the X and Y chromosomes that were also 'sexes' within the conceptual framework of 'sex'. The hermaphrodite reappeared. During the 1920's and 1930's research on hormones (androgens and estrogens) found that maleness and femaleness were relative terms based on the balance of 'male' and 'female' sex hormones in any individual from embryo to adult (Oudshoorn, 1994). The balance, not the variations, defined the 'normal' male and female. The method of testing this hypothesis of a normality began with animal studies, and extended to replacement therapy in humans. The probability of a match between normal femaleness or maleness with a particular hormone balance, was calculated mathematically and presented as fact. The hermaphroditic type of variations in balance were a subtext to the 'normal'. Still lurking in the background was the notion of a correct male or female body type from eighteenth century taxonomies, converted to 'normal' bodies by nineteenth century statistics based sex-eugenics. The two sexualities, homosexual and heterosexual, that had emerged in the nineteenth century, became three sexualities in the early twentieth century with the resurrection of an hermaphroditic sexuality in Freud's bisexuality (Freud, 1974) .

Fausto-Sterling (1993) suggests that if we recognize the hermaphroditic possibilities raised by all the unspoken subtexts of 'normal' bodies, there is actually five sexes; male, female, herm ('pure' hermaphrodite), ferm (female type hermaphrodite) and merm (male type hermaphrodite). Trying to establish which characteristics and behaviours are 'normal' social performances (gender roles) or core identities (gender identity) grounded on five sexes, would be a logistical nightmare. If we take as a given that there is only masculinity and femininity, we could construct at least ten genders. Adding in the range of sexualities, even if limited to homosexuality, heterosexuality and bisexuality, extends the number of genders to at least thirty possibilities. Establishing standards for an harmonic division of labour, or separation of activity into public and private domains, would be as impossible as establishing standards for sex difference or predicting how any social collective would behave. The concepts of 'sex' and 'gender' would become meaningless in social theory, and useless for most sociological research. All of this is not utopian fantasy. It is the reality of the messiness of nonessential bodies that are constantly re- essentialized within conceptual frameworks driven by the necessity for a cosmic-human harmony; a necessity constructed by a privileged 'masculine' reason,[14] and pushed toward the male- as-model-human by phallic drift.

There is a suspicion when reading the historical narrative that there has not been much 'progress' in the development of concepts related to gendering, or sexing/sexualizing bodies, since Hesiod wrote the Theogony in the eighth century BCE. Seeing the characteristics and behaviours of humans as personified by gods and goddesses is only relatively different than seeing those same characteristics and behaviours de-personified as statistical laws. A myth is, after all, a myth regardless of how one constructs it, or inverts it. I have argued that the larger myth, within which the mythologies and rituals of gendering/gender and sexing/sexualizing have emerged, is the myth of a necessity for human behaviour to reflect the behaviour of the elements of the universe. There is just enough reality within that larger myth to keep us ritually re-enacting that necessity. My aim has been to queer and query 'sex' and 'gender' by first acknowledging the power of that larger myth, in order to spoil the constancy of gendered harmony, and second to disrupt the conceptual base of 'sex' and 'gender' by questioning the technologies that have constructed those concepts.

NOTES

1. White, British descent, lesbian and feminist (a radical-socialist-postmodern), with an multidisciplinary background centred in sociology and women's studies.

2. Categorization was also specific to class, race and status among other things, but even race has not always been connected to bodies; in Northern Europe 'race' often meant language group, region or city.

3. Harmony, from the Greek harmonia; joining, concord (Concise Oxford, 1990). I am using this word by its definition as concord, to mean an arrangement of parts directed toward the agreement between/among those parts; the parts in this case being both cosmic: stellar and planetary bodies as well as concepts of soul/spirit, and material: human elements of body, and embodied behaviours and traits.

4. Space does not allow for tracing the development of the sky-god, eschatology, or ritual. These notions are well developed in Hesiod's cosmogony, particularly the Demeter/Persephone myth, and well discussed in contemporary feminist spirituality literature, and histories of ancient cultures. See for example, Blundell, 1995; Lerner, 1986; Stone, 1976. There has been an enormous effort on the part of feminist theologians to bring a positive feminine into Judeo-Christian belief systems. However, like Mary Daly, I find these efforts strained and based more on the valorization of 'woman', than on fact from text. See Daly, 1985; Fiorenza, 1992.

5. We are still doing this is in celebrations of the Solstice, New Year, and the split rituals of Christmas and Easter.

6. I am using the terms public and private in their broadest sense as actual spaces where human activity occurs, or abstract notions of spatial boundaries where private activity can exist in public space, or vice versa.

7. See Hacking, 1995b on memory; Wertheim, 1995 on Physics and unified theory; Rose, 1994 on Bio-medicine, specifically the Human Genome Project.

8. Reversible time refers to the laws of gravitational force that determine that a falling body goes through repetitive cycles of motion as it is pulled downward; if like a rubber ball, the falling body hits resistance, its trajectory upwards will entail exactly the same cycles in reverse until it reaches the initial condition of rest. See Prigogine and Stengers, 1984.

9. Prigogine & Stengers (1994) point out that the clock as actual mechanical instrument, or philosophical metaphor did not yet rule human life as it would begin to do during the nineteenth century. Time was still a relative, and relatively unstandardized concept.

10. The fact that it was not ALL men, or that SOME women were also participants in this process does not change the historical evidence that dividing bodies by sex-sexuality was/is primarily a male/masculine enterprise.

11. And all bodies associated with concepts of femininity/femaleness; slaves, 'primitive' cultures, serfs, workers etc.

12. The only unattributed source I have for this phrase is the Win Some/Lose Some column of On the Issues: The Progressive Woman's Quarterly, IV:4, Fall 1995.

13. As Lewin (1984) illustrates, test instruments designed to measure masculinity and femininity were based on oppositeness, therefore the variation in femininity or masculinity among women/among men was not tested until the 1970's.

14. Given the preceding discussion, it would be amusing to try and situate the 'masculinity' of reason among all the possibilities. Were the elite men of reason males, merms, herms, or perhaps more complicated variations like high androgen bisexual herm, or low estrogen homosexual merm ? The effect of these distinctions may be more important than we imagine. I am thinking of the consternation evident in some readings on Newton when an

attempt is made to reconcile his 30 year, non-scientific involvement with the magic of Alchemy, with his space-time-matter discoveries. See Wertheim, 1995; Prigogine & Stengers, 1984; and indirectly Grosz, 1995.

Charter VI: Conclusion

> ... individual sex categories - female/male, woman/man, girl/boy ... (Thorne, 1990:102)
>
> We daily mark and give life to the dichotomous gender categories, girl/boy, female/male, man/woman (Thorne, 1993:158)

The interpretive analysis in Chapter Five has drawn conclusions from the historical narrative, suggesting areas for further development in genealogies, or historical sociologies of sex and gender. It is within the analysis of the conditions that make a concept like 'sex', 'gender' or 'sexuality' possible, that we will discover the strategies for an emancipatory resistance, that does not as Zeitlin (1982) shows simply invert the concepts. This concluding Chapter will enlarge on this idea by first responding to the research questions posed in Chapter One, and second by presenting a contemporary example of how concepts structure, and mystify, the production and presentation of knowledge on 'sex' and 'gender'.

The two quotes above illustrate the power of naming. Is male/female 'sex' or 'gender', or both? Does it matter if they are used interchangeably? Yes, it does. Each of these concepts, as a mental picture, pulls together a constellation of aspects of individual or social phenomena. This thesis has shown that 'sex' and 'gender' are not the same concepts in their historical construction. One could not do a genealogy of 'sex' and then say that they have therefore also done a genealogy of 'gender'. Keeping these concepts, and the technologies of their construction, separate, while recognizing their points of interrelatedness, is necessary for social theory directed at either understanding contemporary or historical social phenomena, or understanding contemporary or historical social change. We should not encourage phallic drift that is enhanced by a de-politicization of 'sex' or 'gender', when the two concepts are collapsed one into the other. The conceptual bridge that has linked sex and gender, and both of those concepts to sexuality, is the statistical determinism that emerged in the latter half of the nineteenth century. The conditions of possibility for the invention of 'sex', 'gender' and 'sexuality', as concepts begins with the emergence of rationalism, and the Pythagorean notion that quantification constitutes any 'thing' as an object in the study of human life. Once femaleness/maleness (sex), and masculinity/femininity (gender) became objects, it was an easy step to first combine them (Darwin), then separate them (Money-Stoller), then combine them again (Rubin-sex/gender system), and now attempt to separate them once again (cf. Butler, 1993) None of these theoretical moves 'spoils' the structure of the concepts, because the concepts are taken for granted as 'real'.

It is through the concept of 'normal' that we identify people as having a sex, being a gender, or preferring a sexuality. In the late nineteenth century production of the concept of normal in Social Darwinism and eugenics, the two sex model was solidified by incorporating the 'gender' terms masculinity and femininity into the 'sex' terms male and female. Since we are still doing social theory within that two sex model, it is fair to say that gender is the 'most salient characteristic of persons' and that sex is the 'norm' that makes persons 'viable' (see quotes at opening of Chapter One). Liz Stanley (1995) and Judith Butler (1993) are making identical statements from very diverse perspectives, because within the conceptual framework established by the Darwin-Galton theory/technology, we cannot be sexed, or sexualized without also being gendered. The advantage of Fausto-Sterling's (1993) whimsy, aside from speaking a reality for a large number of people, is that breaking up the two sex model reveals how essentialized we really are, even within our notions of social constructionism. However, that essentialism is not based on biology. The historical narrative clearly shows that there is no essential biological body to use for a biological determinism. Whatever is conceptually attached to any body, is determined statistically, not biologically. It may be true that we 'perform' discourses (Butler, 1990, 1993), but we need to be clear about which discourses we are 'citing' or 'performing'.

The concept of gender (as role or identity) was created within psychology and psychoanalysis for a very specific purpose. Gender emerged out of the need for criteria to provide a normal body for the intersexed, and a correct body for the transsexual. John Money (1955) and Robert Stoller (1968) dis-embodied the tertiary sex characteristics that Darwin had embodied. In the process they essentialized the body, reinforced the two sex model, and supplied the social constructionist movement with a concept. As Smith (1990) points out, a concept can too easily substitute for reality. Gender was an ideal concept because it described both internal states of being, and external social performance, and therefore could be all things to all social theorists, without having to worry a great deal about reference back to actual people negotiating actual social situations. The sweeping generalizations constructed with the use of the concept of gender, repeated exactly what Quetelet had proposed nearly two hundred years ago. The free will and chance, of behaviours and characteristics dis-embodied in the Money-Stoller creation of the concept of gender, disappeared, under the law of large numbers, back into the 'average man'. The concept of gender came to be 'analytically privileged' because it was open to any definition, and it was only a minor adjustment of language (from sex to gender) for the statisticians. What was lost in the adoption of this concept was the necessity to separate out the active processes of gendering, from the passive abstraction of gender. I have suggested several of these processes, that could be privileged as sites for extensive research: phallic drift rather than patriarchy, the necessity of cosmic-human harmony that requires attention to knowledge being produced in all sciences, the connection between the meanings of masculinity/femininity and actual divisions of labour and separate spheres of activity, and finally the role of sexing and sexualizing bodies that will require a reincorporation of biology into social theory.

The last of my research questions, the relationship between the concepts of sex and gender and sociology/social theory is perhaps the most difficult to answer. Strictly speaking, the concept of gender was 'created' within psychology/psychoanalysis. I have argued that the development of social science, specifically the connection among Darwinian evolution theories, statistics, and mathematical probability provided the conceptual conditions of possibility for the concept of gender. It can be argued that positivism is now exclusive to a particular group within Sociology, and that the crude use of statistics and probability at the end of the nineteenth century has been modified by strict rules of criteria. However, the boundaries of a 'scientific' Sociology still require a competence in statistics that spills over into gender research, and gender is being created and recreated on a daily basis by general social surveys and polls. Everytime a Journal article begins from a research instrument/method asking for sex (male-female), and reports the results using the terms 'men' and 'women', gender is being created, and the two sex model is given legitimacy. To analyze the role of sociology/social theory in either the creation, maintenance or reproduction of the concepts of sex, gender and sexuality, sociological theory and practise have to be separated from social theory. As a discipline, Sociology has largely remained within the context of its founding fathers; Marx, Comte-Durkheim, Galton-Pearson and so on, with some acknowledgement of the less quantitative theories of St. Simon, Fourier, and Weber. Social theory on the other hand is multi-disciplinary, emerging out of the eighteenth and nineteenth century philosophers, taken up by women and men as idealistic theory, or applied 'social work'. In contemporary terms, social theory crosses disciplinary boundaries in the social sciences, the humanities and biology/bio-medicine. Whereas we could say that any discussion of the social was social theory, and included divisions of humanity by concepts of masculinity and femininity since at least the fourth century BCE, sex (sexing and sexualizing bodies) began in medicine and natural philosophy, and was not visibly a part of social thought until Rousseau, and not totally incorportated into social theory until Darwin. From that point on social theory within sociology helped enforce concepts of sex, gender, sexuality and a two sex/two gender model, simply by not paying attention to other knowledges that would have revealed that these concepts were themselves social phenomena that required an explanation. Social theory within a feminist sociology, or outside of sociology, has payed attention to a degree, but even the most 'radical' theorists (eg: Butler, 1993; Grosz, 1995; Smith 1990) hang on to a two sex/two gender model as if the concepts that create that model were 'real'.

Developing archaeologies of knowlege, and constructing genealogies of concepts, or ideas, that structure our life in the present, is an effective way of assessing both the historical relevance of those concepts/ideas, and of deconstructing the power networks that structure knowledge production, by exposing the agents, and agencies of that production. Concepts do not come to us as bolts of intuition, they are carefully constructed to serve a purpose; a purpose that is often mystified once we allow concepts to substitute for reality. Concepts, once constituted and legitimized as forms of thought, provide the hidden premises and assumptions that structure arguments for sex-difference. I would like to end, as I began, in the present with an example that illustrates the conclusions drawn for the interpretive analysis of the historical narrative.

A recent issue of Mclean's Magazine (January 22, 1996) featured an article on Secrets of the Brain. In the second paragraph we are told that research intends to "come up with a diagram of the typical brain" (Nichols, 1996:4). We know from the historical narrative that 'typical' is derived from a central tendency, and that means 'normal'. Which brain will be considered 'normal', male, female, herm, ferm or merm? If the present continues to follow the past, phallic drift will base this 'typical' brain on either a male mode as human, or on a 'normal' differentiated by sex, specifically those who are sexed within a white, middle class, correct body type established through masculine reason. Concept # 1, there is a 'normal' brain hidden beneath apparent body differences. Next we are told that "human consciousness and thought emerge" from neuronal activity (Nichols, 1996:45), and emotions like fear originate in a specific part of the brain. Concept # 2, anatomy is destiny, there is no effect of the environment or social structuring on consciousness or emotionality. Once the concepts of a 'normal' brain and 'destiny' in a hard wired brain (1996:46) are established (our consciousness has been raised through discourse?), we move on to sex differences (1996:49)

The entire section titled Boys, Girls and Brainpower, is conceptually based on premises and assumptions not supported by biological evidence. First the tile infantilizes the subject matter; brainpower is about boys and girls, implying that whatever this power is, it is hardwired in childhood, if not at conception. It is assumed that boys become men, girls become women; which men, which women. Are we talking about eighteenth century taxonomist's correct body types, Quetelet's 'average man', Galton's 'normal', or Fausto-Sterling's five sexes? Concept # 3, there is a sex 'thing' called a male, or a female, each of these things conceptually embracing all women, and all men (except the scientist, who by using masculine reason exempts herself from being either 'thing'). Further, Concept # 4, there are two sexualities, the homosexual and the heterosexual both of which as 'things' embrace all people who casually or exclusively prefer same or different sex partners. There is no room for bisexuality in brain research. Then we get Concept # 5. Since there are only sexes, and two sexualities, tertiary sex characteristics like verbal/spatial ability, must be differentially distributed to create two genders. And finally to offset any arguments against all of these conceptual assumptions, we are told that the scientist (Sandra Witelson) is only interested in 'truth'. Concept # 6.

If we take each of these concepts, normal, destiny, duality, sex, gender, sexuality and truth, and develop parallel genealogies from the historical narrative, we will find that what we are actually reading here is a process of phallic drift directed toward harmonizing brain anatomy/function with sex and sexualized bodies in order to prop up the processes of gendering, thus reconstituting a cosmic-human harmony that currently demands a renewed division of labour and return of the female/feminine to privatized spaces. We certainly should be amazed (overwhelmed by wonder) at the ability of masculine reason to invent and reinvent the conceptual conditions of possibility for a harmony that benefits those who profess to be reasonable men. As long as we allow the concepts of sex and gender to remain solidified in a two sex model, we are all complicit in the structuring of those conditions of possibility.

Appendix

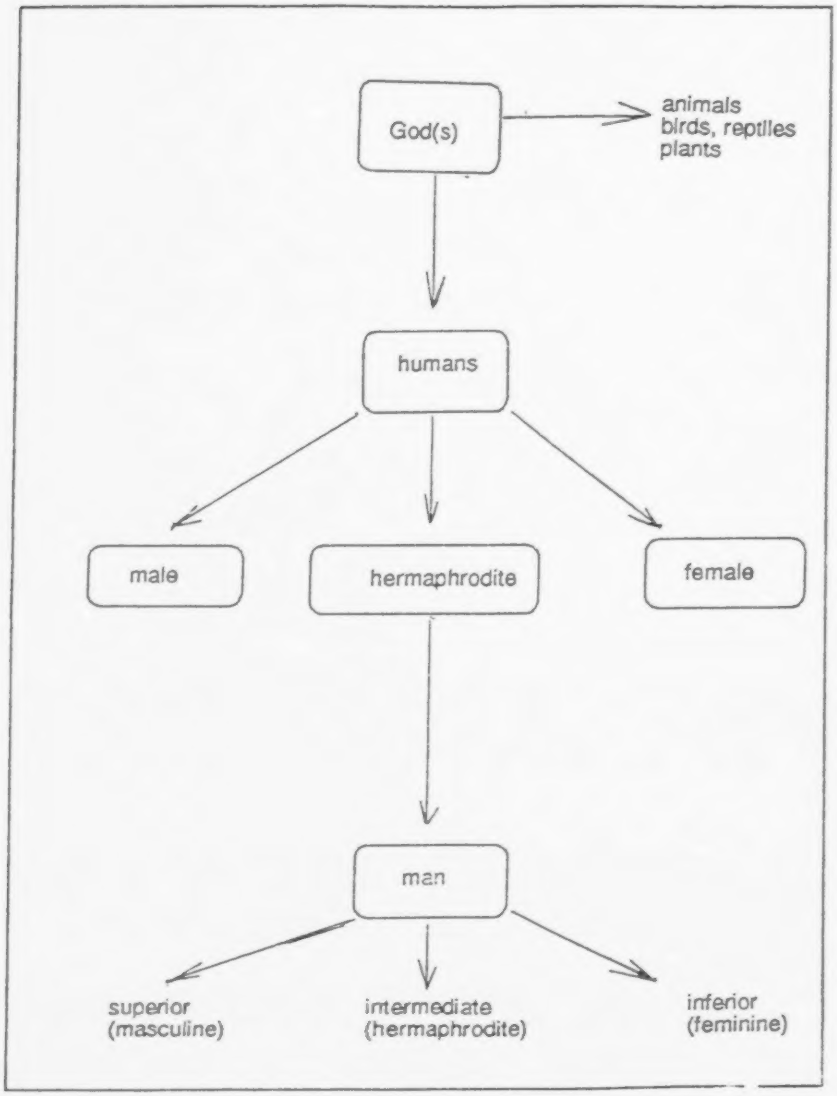
God(s)
animals
birds, reptiles
plants
humans
male
hermaphrodite
female
man
superior
(masculine)
intermediate
(hermaphrodite)
inferior
(feminine)

Figure 1. Heuristic representation of the one sex model 600 BCE - c.1974

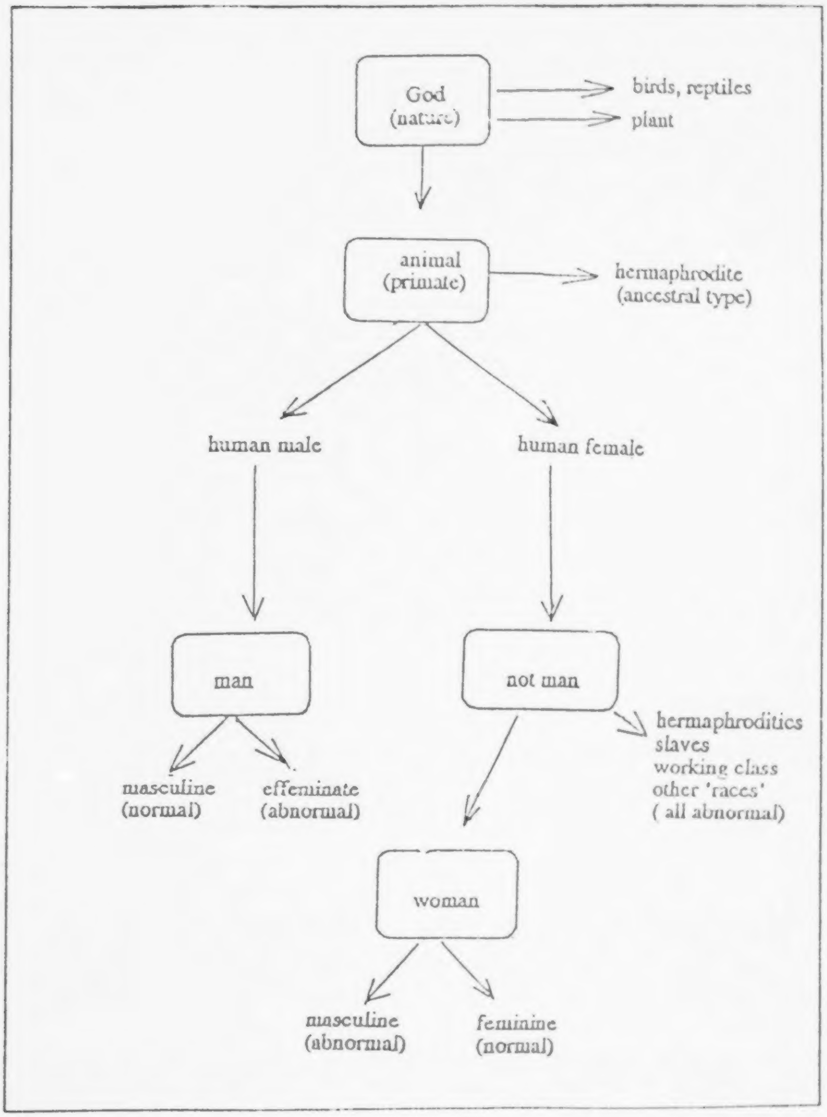
God
(nature)
birds, reptiles
plant
animal
(primate)
hermaphrodite
(ancestral type)
human male
human female
man
not man
masculine
(normal)
effeminate
(abnormal)
hermaphroditics
slaves
working class
other 'races'
(all abnormal)
woman
masculine
(abnormal)
feminine
(normal)

Figure 2. Heuristic representation of two sex model as opposite 'sexes' @ 1874 [valorized feminine=woman replace 'not man' c.1890s - 1990s]

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